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BLM-SOHIO PROJECT
WORK PREPARATION PLANS
FOR CONTRACT #YA-512-CT6-181
14 June 1976

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ENVIRONMENTAL RESEARCH
& TECHNOLOGY, INC.

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WORK PREPARATION PLANS
FOR CONTRACT #YA-512-CT6-181

14 June 1976

Prepared for
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

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WTC/1107/76
P-5067

June 14, 1976

Mr. Jack Lahr
Bureau of Land Management
SOHIO EIS Project Office
Bldg. 55
Los Alamitos Naval Air Station
Los Alamitos, California 90720

Re: Submission of Preparation Plan, Contract #YA-512-CT6-181

Dear Jack,

As called for by the schedule in the Contract, ERT is pleased to submit the Preparation Plans for the Geotechnic, Socio-economic, Air Quality, Water Quality and Noise sections of the Environmental Impact Statement for SOHIO Transportation Co. pipeline project. We have tried to follow the general outline you provided us on 1 June 1976. Task numbers generally correspond to the headings within the outline.

The Preparation Plans have been written by the individual task leaders for each of the work component areas and therefore you will find a significant variation in style, presentation, and approach. Such variations reflect the differences which are normally associated with technical disciplines and the variety of sources to be utilized. It is anticipated that future submissions will also differ in approach, but not in style and format, which have been specified by your staff. Due to the time constraints and purpose of the Preparation Plans, we have not uniformly followed the format criteria for this submission.

In the Preparation Plans we have attempted to utilize, as much as possible, the graphics material which will be provided by the applicant. It is our understanding that such material will consist of copies of the colored maps without any overprinting on them. It is our opinion that these maps may not be suitable for all areas, especially geotechnic, as the coloration indicates phenomena and conditions which do not necessarily agree with the findings of our team. Furthermore the scale changes at the California-Arizona border tend to confuse the reader. We feel that if the BLM intends to use these maps exclusively we should discuss the matter to insure correct technical content in the final product.

Mr. Jack Lahr
Dr. George Lauer
Preparation Plan
June 14, 1976
Page 2

With respect to Section 3.2 of the EIS we have defined cumulative impact to include the proposed project and only those projects that are regional in nature and within the geographical area. Thus, for example, the socio-economic work component will not treat the impact of small planned developments, but would treat major regional projected changes in land use patterns.

During the development of the Preparation Plans we have uncovered a number of significant "data gaps". These include, but are not limited to:

- Unavailability of the correct Hydrostatic Test Plan for the pipeline.
- Unavailability of the Oil Spill Contingency Plan.
- Unavailability of a detailed Construction Plan.
- Significant uncertainty as to the exact routing of the pipeline and to the exact location of facilities, including pumping stations, terminals, and base maintenance camps.

The above items are required if our team is to provide BLM with a realistic assessment of the potential impact of the proposed project on the environment. In the absence of the material we have only two options:

- 1) Assumption of "worst case" conditions.
- 2) Development of the material ourselves.

The latter option is, clearly, beyond the scope of the contract and would probably be beyond the scope of your charter. The former option is, in our opinion, not constructive and would not properly be the basis of a defensible impact assessment. We therefore request your staff contact the applicant and stress the urgency of the design data requirements. We would like to point out that the applicants submission does have chapters which address some of the material covered. However it is our opinion that these chapters are preliminary approaches and do not provide sufficient detail to make a realistic estimate of the potential impact. In addition there appears to be a number of inconsistencies which are of sufficient importance to cause us to doubt the validity of specific plans. Examples are:

- Construction Plan. The plan as shown in Figure 1F-1 (page 1F-3) indicates that start up of the system will take place 8 months prior to completion of the Long Beach terminal facility test and 6 months prior to completion of the pier facilities.

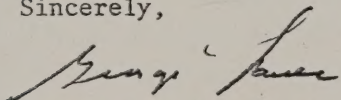
ERT

- Hydrostatic Test Plan. Referring again to the construction schedule, pipeline construction is scheduled for completion at least 2 months prior to completion of the pump station construction. This schedule is not in accordance with the proposed methodology for hydrostatic testing.
- Oil Spill Contingency Plan. Section 1H of the submission treats only leaks in any detail. Significant attention must be paid to pipeline fracture due to potential seismic movement and the maximum volume of petroleum which could drain from any given section of the route, especially in environmentally sensitive areas. A clear presentation of which valves will close automatically, which can be remotely closed by the control centers and which require manual closing is required.

In addition to the above mentioned items, Dr. Krablin has prepared a list of items, presently known to be in the files of Williams Bros. These documents should be of great potential benefit for the assessment. A request for these documents has been transmitted to Mr. Tulloss under separate cover.

We look forward to your comments regarding the Preparation Plans.

Sincerely,



George Lauer, Ph.D.
BLM-SOHIO Program Director

GL/sa
Attachment-Preparation Plan

ERT

Vol. 100, Pt. 1

The first of the two main sections of the paper is devoted to a discussion of the evidence for the existence of a 'cultural lag' in the case of the modern world. The author argues that the material culture of the modern world has advanced far more rapidly than the non-material culture, and that this has led to a state of 'cultural lag' in which the non-material culture is unable to keep pace with the material culture. This is illustrated by the example of the automobile, which has created a new set of problems for the non-material culture, such as the need for traffic laws and the need for a new set of social norms.

The second main section of the paper is devoted to a discussion of the evidence for the existence of a 'cultural lag' in the case of the primitive world. The author argues that the material culture of the primitive world has advanced far more rapidly than the non-material culture, and that this has led to a state of 'cultural lag' in which the non-material culture is unable to keep pace with the material culture. This is illustrated by the example of the primitive world, which has created a new set of problems for the non-material culture, such as the need for traffic laws and the need for a new set of social norms.

The author concludes that the evidence for the existence of a 'cultural lag' is strong in both the modern and the primitive world. He argues that the material culture of both the modern and the primitive world has advanced far more rapidly than the non-material culture, and that this has led to a state of 'cultural lag' in which the non-material culture is unable to keep pace with the material culture. This is illustrated by the example of the automobile in the modern world and the primitive world, which has created a new set of problems for the non-material culture, such as the need for traffic laws and the need for a new set of social norms.

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WORK PREPARATION PLAN
GEOTECHNIC

INTRODUCTION

The preparation plan has been prepared in conformance with the requirements of the BLM as stated in the RFP, our proposal and the discussions held with BLM technical personnel. The plan is structured to follow the outline provided on 28 May, 1976 to as great a degree as possible. Deviations are introduced only where it is felt they are necessary for clarity of presentation. The scope of the geotechnic work component encompasses two principal efforts.

- 1) Preparation of the material required within the body of the EIS in the areas of geology, soils, and geological hazardry.
- 2) An engineering evaluation of the proposed action to include all aspects of the construction and operation of the pipeline. This evaluation to be prepared as a separate appendix to the body of the report. The outline of the evaluation has been included within the preparation plan.

It should be noted that the schedule and estimated resources required are based on the fundamental assumption that all relevant engineering materials will be made available to ERT by the applicant within one week of submission of this preparation plan.

TASK AND SUBTASK DESCRIPTION
CHAPTER 2
DESCRIPTION OF THE ENVIRONMENT

2.1 Existing Environment

2.1.3 Geological Setting

The objectives of this task are to describe the existing physical geological conditions of the pipeline route from the boundary of the Port of Long Beach to and including the terminal at Midland, Texas. The applicant submission as well as significant supplemental material will be used. Conditions to be described include the following:

- Physiography,
- Geology, and
- Geologic Hazards

2.1.3.1 Physiography

This subtask will include a description of the physiographic characteristics of the geomorphic provinces along the project. The landforms and the topographic characteristics of the various geomorphic provinces will be described in relation to the project.

2.1.3.2 Geology

This subtask will include a description of the regional geology, including structure, historical geology, paleontology, stratigraphy, lithology, and mineral resources along the project route. In addition, the regional seismic setting will be described, including potential future seismic characteristics (recurrence intervals of large magnitude earthquakes, intensity, ground motion characteristics, fault rupture, etc.).

2.1.3.3 Geologic Hazards

This subtask will include a description of the geologic hazards along the project. Hazards that will be considered include: fault rupture, strong ground shaking from earthquakes, liquefaction, lurching, tsunamis, seiches, slope instability, erosion, river scour, siltation, expansive soils.

COMPLETION SCHEDULE

Draft of report to be completed by July 6, 1976.

RESOURCES REQUIRED

230 hours - ESA

24 hours - Lindvall, Richter Associates

RELEVANT AVAILABLE DATA

- U.S. Geological Survey
 - Professional paper
 - Water Supply Paper & Monographs
 - Bulletins
 - Miscellaneous Field Studies Maps
 - Yearly Mineral Resources volumes
 - Circulars
 - Maps, Charts, Atlases
 - Geologic quadrangle maps
 - Hydrologic investigation atlases
 - Geophysical investigation maps
 - Mineral Investigations resource maps
 - Miscellaneous investigations series
 - Oil and Gas Investigation Maps
 - Miscellaneous Reports
- Arizona Bureau of Mines, and State Engineer
 - Bulletins
 - Water Commission reports
 - Geologic Quadrangle maps
- California Division of Mines and Geology
 - Bulletins
 - Special Reports
 - County Reports
 - Circulars
 - Geology Magazine
 - Fault Map
 - State Map Sheets
 - Open File Maps and Reports
- California Department of Water Resources
 - Bulletins on Water Conditions in California
 - Water Resources Investigations (with USGS)

*add
BLM
Mineral
Resources
data*

- New Mexico Bureau of Mines and Mineral Resources
 - Bulletins
 - Circulars
 - Memoirs
 - Ground-water and Hydrologic Reports
 - Geologic Maps
 - Progress Reports, Resource Maps, Petroleum Maps
- General Data Sources
 - Bulletins of GSA, SSA, AAPG, AEG

In addition, we will review available information from WASH and ERDA reports pertaining to areas within the project region. These include unclassified AEC and ERDA reports, and Environmental Impact Statements.

METHODOLOGY

* We will analyze sections 2A.3, 2A.4 and 2A.5 of the Sohio EIA to determine completeness and accuracy and will identify data gaps. Where data are available, we will fill data gaps within the constraints of the approved time schedule and allotted man-hour distribution. Data gaps that would require extensive additional research or field work are not within the scope of the present contract. However, they will be identified, and an estimate of additional necessary work would be presented to the BLM Project and COAR.

Extensive use will be made of our in-house library of soils, geologic, seismologic, geotechnic, and related data. In addition, we will search through the libraries of both the U. S. Geological Survey and Stanford University for additional data.

An aerial reconnaissance will be performed in a rented single-engine aircraft and will be supplemented by field inspection of selected segments of the pipeline route. This reconnaissance will be performed between June 22 and June 26.

Drs. Jahns and Richter will review and provide comments on the descriptions of seismicity and geological hazards.

After reviewing available data, performing the aerial and field reconnaissance and analyzing all this material, a report describing the conditions will be prepared by using the EIA report and maps, and adding, deleting, or correcting the presented material as necessary. Modifications to EIA maps will be presented in rough form on transparent overlays for final inking or typesetting by BLM.

Representative photographs of physiographic and geologic conditions and of typical geologic hazards will be presented in 3½" x 5" Kodacolor prints.

2.1.4 Soils

This task will consist of the description of the soils along the project, their origin, physical and chemical characteristics, engineering limitations and relative environmental sensitivity.

COMPLETION SCHEDULE

Draft of report to be completed by July 6, 1976.

RESOURCES REQUIRED

44 hours

RELEVANT AVAILABLE DATA

USDA Soil Conservation Service, Soil Survey reports and maps
Williams Bros. EIA.

METHODOLOGY

Soil reports and maps prepared by the Soil Conservation Service will be reviewed to extract relevant information. Sensitivity of the soils will be analyzed with respect to the proposed project, and the maps prepared by Williams Bros. will be revised where necessary to accommodate additional data, or modified where necessary.

2.2 Future Environment Without the Project

2.2.3 Geological Setting

This task will consider major changes in the geologic environment should the project not be implemented. No major physiographic nor geologic changes are anticipated between the present and the year 2,000. Normal physiographic and geologic processes are too slow to be noticed in the short span of 25 years. Geologic hazards, however, represent sudden changes that could affect the environment noticeably. However, only a major earthquake accompanied by surface fault rupture is reasonably foreseeable within the next 25 years. This hazard would be addressed in this section.

COMPLETION SCHEDULE

Same as for 2.1.3 Geological Setting.

RESOURCES REQUIRED

16 hours - Lindvall, Richter Associates
8 hours - ESA

RELEVANT AVAILABLE DATA

Same as for 2.1.3 Geological Setting.

METHODOLOGY

A scenario will be developed to forecast effects of a large magnitude earthquake accompanied by fault rupture in the Southern California area. This will be based on accounts of similar historic events such as the 1872 Owens Valley, California; the 1954 Dixie Valley, Nevada; and the 1971 San Fernando, California, earthquakes. An analysis of such an earthquake's general effects on the environment will be made.

2.2.4 Soils

No major changes are anticipated in the soil composition or distribution between the present and the year 2,000. Development of soils is a very slow process and would not be noticed during the short span of 25 years. Changes in the soils could be brought about by increased erosion rates, but these are not anticipated.

COMPLETION SCHEDULE

Same as for 2.1.3 Geologic Setting.

RESOURCES REQUIRED

5 hours

RELEVANT AVAILABLE DATA

USDA Soil Conservation Service.

Geologic hazards section,

METHODOLOGY

Same as for 2.1.4 Soils.

CHAPTER 3
THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1 Existing Environment

3.1.3 Geological Characteristics

The objectives of this task are to describe the impacts during construction and operation of the project facilities. The applicant's identification of effects of the project's construction and operation on the geological environment will be reviewed and supplemented as necessary. In addition, effects of the geological environment on the construction and operation of the project will be identified. Particular attention will be given to the effects of system failure due to faulting and seismic shaking.

3.1.3.1 Physiography

During this subtask, we will analyze the effects of construction and operation of the project on physiographic characteristics. Anticipated effects are minor changes in landforms due to excavation and grading such as modification of slopes, alteration of natural drainage courses, alteration of microrelief, etc.

3.1.3.2 Geology

During this subtask, we will analyze the effects of construction and operation of the project on geologic characteristics. Anticipated major effects are changes due to excavation, blasting, and grading such as:

- disruption of natural ground stability
- alteration of mass wasting processes
- alteration of shallow ground water conditions
- thermal effects
- alteration of streambed configuration at river crossings
- disruption of mineral resources

Effects of geologic processes on the project will be evaluated. These are described in the following geologic hazards section.

3.1.3.3 Geologic Hazards

The effects of geologic hazardous processes on the project will be evaluated. In particular, we will analyze:

- faulting and seismic hazards
- natural slope instability

- volcanic activity
- scour from flooding
- changes in stream profile
- changes in ground water conditions
- differential settlement
- subsidence
- erosion and sedimentation processes

COMPLETION SCHEDULE

Preliminary draft report listing of sources of possible impacts, July

Preliminary draft report of impact evaluation, August 23.

RESOURCES REQUIRED

32 Hours - Lindvall, Richter Associates

RELEVANT AVAILABLE DATA

Sames as 2.1.3, 2.1.4

METHODOLOGY

We will review the applicant's proposed construction procedures, especially those related to ditch excavation, bedding and backfill, pipeline handling and assembling, special dewatering and ground stabilization procedures, etc., in order to insure that incorrect or uncontrolled procedures do not create undue

stress or damage to the pipeline which could invalidate design assumptions and lead to unexpected failure. In addition, we will evaluate, on the basis of our professional experience and available government/industry standards, the adequacy of the proposed operation practices.

The review and analysis of direct effects of construction and operation procedures from the geotechnic environment will include effects of such practices as clearing, stripping, excavation, blasting, dewatering, stockpiling, backfilling, cleanup, etc. on geologic and soil resources in and near the right-of-way. This evaluation will be made on the basis of our diverse professional experience with construction and operation impacts, and will include indirect impacts such as effects of blast vibration on unusual geologic formations, effects of dewatering on nearby ground stability, effects of soil disturbance on future wind or water erosion rates, etc.

An analysis of system failure due to earthquake shaking, fault rupture, scouring, landsliding, or subsidence will be performed to determine potential damaging effects on the physiographic and geologic setting, on soils, and on ground water conditions. This analysis will be integrated with the engineering analysis to be performed by Robert Brown Associates, which will be submitted as an appendix to the report.

3.1.4 Soils

Project impacts on existing soils during construction and operation of the project will be analyzed. In particular, we will analyze the following:

- disruption of natural soil distribution
- mixing of soil profiles
- erosion potential
- siltation effects at river crossings
- effects of flash-floods in the desert environment
- compaction of soils
- loss of productivity
- changes in soil physical properties

COMPLETION SCHEDULE

Preliminary draft report listing impact sources, July 13.

Preliminary draft report of impact evaluation, August 23.

RESOURCES REQUIRED

70 Hours

RELEVANT AVAILABLE DATA

Williams Bros. EIA and related documents
Soil Conservation Service reports
In-house data on previous similar jobs

METHODOLOGY

Same as for 3.1.3 Geological Characteristics

CHAPTER 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

4.0.1 Methodology for Determining Mitigating Measures

This task will consist of the review and analysis of the mitigation, avoidance, or enhancement guidelines proposed by the applicant. The evaluation will be made on the basis of our professional experience with construction procedures and operation characteristics of pipelines, and the design of mitigation measures.

4.0.2 Summary of Mitigating Measures

A listing of mitigating measures that would prevent or reduce impacts detrimental to the geologic features, ground water conditions, and soils will be prepared. The listing will include measures required by Federal Agencies, and State and other entities, and will be arranged geographically.

COMPLETION SCHEDULE

Preliminary draft report, August 23.

RESOURCES REQUIRED

120 Hours - ESA

RELEVANT AVAILABLE DATA

Agencies with authority to regulate geological or soils aspects identified so far include:

- U.S. Dept. of Labor, Occupational Safety and Health Administration (OSHA): jurisdiction during construction of trenches.
- U.S. Environmental Protection Agency: jurisdiction over surface water discharges. Percolation is covered by Safe Drinking Water Act of 1974.
- California State Water Quality Control Board: jurisdiction over surface and ground water discharges, and sewage disposal.
- Arizona Dept. of Health: jurisdiction over water discharges.
- Texas Dept. of Health: jurisdiction over water supply and dewater disposal.
- Texas Parks and Wildlife Dept.: jurisdiction over river crossing construction.
- Texas Water Quality Board: jurisdiction over waste discharges into or near State waters.

Other local entities require a variety of permits to construct, operate and maintain facilities. Generally, these are not of geologic or geotechnic nature.

U.S. Army Corps of Engineers: jurisdiction over construction in navigable waters (refers to bank stability, erosion, dredging, etc.)

METHODOLOGY

We will analyze the mitigating measures proposed by the applicant to determine their applicability and will identify additional measures based on our professional experience and standard practice on similar projects.

CHAPTER 5

ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

5.1.3 Geological Characteristics

Unavoidable adverse impacts that would affect the geological characteristics include minor changes in local topographic conditions and alteration of the physical integrity of rock or unconsolidated sediments due to construction operations. Operation and maintenance are not anticipated to have unavoidable adverse impacts on the geological characteristics of the project.

Unavoidable adverse impacts caused by geologic hazards include rupture of the pipeline and oil spills that could contaminate ground and surface waters. The possibility of these impacts and their extent will be discussed and evaluated.

5.1.4 Soils

Soils could be adversely impacted during construction, operation, and maintenance by mixing soil profiles, compaction, loss of infiltration and percolation potential, and accelerated erosion due to removal of vegetative cover. The possibility and extent of these impacts would be discussed and evaluated.

COMPLETION SCHEDULE

Preliminary draft report, August 23.

RESOURCES REQUIRED

78 Hours - ESA

12 Hours - Lindvall, Richter Associates

RELEVANT AVAILABLE DATA

Williams Bros. EIA and related documents

Behavior history of existing pipeline and its facilities

In-house data on previous similar projects

METHODOLOGY

A realistic evaluation of construction and operation practices, as well as of geologic and soils characteristics and hazards will be performed. Unavoidable adverse impacts will be identified and evaluated on this basis.

FINAL REPORT

The preliminary drafts submitted prior will be reviewed and modified where necessary. Changes requested by BLM reviewers will be incorporated.

COMPLETION SCHEDULE

September 16, 1976

RESOURCES REQUIRED

326 Hours - ESA

8 Hours - Lindvall, Richter Associates

PREPARATION PLAN
FOR
GEOTECHNIC EVALUATION REPORT
(ENGINEERING)

TASK OUTLINE

TASK 1.0 OVERVIEW ANALYSIS OF APPLICANT'S SUBMISSION

Task 1.1 Design Overview

Task 1.2 Operations Overview

TASK 2.0 INFORMATION GATHERING

Task 2.1 Literature Search

Task 2.2 In-house Information

Task 2.3 Project Data

Task 2.4 Codes, Regulations, Guidelines

TASK 3.0 EVALUATE EXISTING PIPELINE

Task 3.1 Original Design and Construction

Task 3.2 Maintenance and Operating Experience

TASK 4.0 DESIGN REVIEW

Task 4.1 Codes and Regulations

Task 4.2 Hydraulics

Task 4.3 Piping Design

Task 4.4 Materials of Construction

Task 4.5 Tank Design

Task 4.6 Structural Design

Task 4.7 Electrical

Task 4.8 Maintenance Provisions

Task 4.9 Piping Protection

- Task 4.10 System Protection
- Task 4.11 Fire Protection
- Task 4.12 Operating Surveillance and Control
- Task 4.13 Communications
- TASK 5.0 SAFETY REVIEW
 - Task 5.1 Operating Procedures
 - Task 5.2 Maintenance Procedures
 - Task 5.3 Fire Protection Procedures
 - Task 5.4 Emergency Procedures
 - Task 5.5 Power Interruptions
 - Task 5.6 Congested Area Construction
- TASK 6.0 FAILURE MODE AND EFFECTS
 - Task 6.1 Terminals
 - Task 6.2 Pumping Stations
 - Task 6.3 Pipeline
- TASK 7.0 POTENTIAL FOR ENVIRONMENTAL DAMAGE
- TASK 8.0 UNAVOIDABLE ADVERSE IMPACTS
- TASK 9.0 MITIGATING MEASURES

PREPARATION PLAN
FOR
GEOTECHNIC EVALUATION REPORT
(ENGINEERING)

TASK DESCRIPTION AND METHODOLOGY

TASK 1.0 OVERVIEW ANALYSIS OF APPLICANT'S SUBMISSION

Review applicant's engineering data to identify and focus upon problem areas.

Task 1.1 Design Overview

Perform executive review of applicant's engineering data to identify possible areas requiring further definition, design deficiencies, or oversights that could have adverse effects on the environment.

Task 1.2 Operations Overview

Perform executive review of applicant's overall plan for operation of the facility to identify areas requiring further definition or revised approach.

TASK 2.0 INFORMATION GATHERING

Gather data as required to perform the geotechnic evaluation and to identify advanced engineering principles and practices and analytical techniques and methodology insofar as they relate to the facilities provided with this project (see attached list of Data Sources).

Task 2.1 Literature Search

Search libraries, engineering societies, manufacturing societies, national, state, and county agencies' literature and publications for applicable information.

Task 2.2 In-house Information

Review in-house literature and publications and private data sources for utilization in the evaluation.

Task 2.3 Project Data

Obtain necessary background data, calculations, sketches, drawings, specifications, etc., for geotechnical evaluation from Williams

Brothers Engineering Company, El Paso Natural Gas Company, Southern California Gas Company, and Sohio Transportation Company.

Task 2.4 Codes, Regulations, Guidelines

Identify and review applicable codes, standards, regulations, and guidelines as they apply to the design, construction, and operation of the proposed project.

TASK 3.0 EVALUATE EXISTING PIPELINE

Review and analyze data on the existing natural gas pipelines to evaluate their integrity based on design studies, construction records, operation, and maintenance problems.

Task 3.1 Original Design and Construction

Review original design and construction of the existing natural gas lines and applicant's plans for modifications to determine the feasibility of their utilization as a media for crude oil transportation as proposed and what alterations and changes might be required, if any.

Task 3.2 Maintenance and Operating Experience

Review maintenance and operating experience of existing natural gas lines to identify possible areas of further design considerations, physical inspection, safety considerations, or environmental exposures.

TASK 4.0 DESIGN REVIEW

Perform a comprehensive engineering analysis of the project design criteria, process and engineering designs, plans, specifications, and construction methods for the pipeline and terminals including representative components such as transfer manifolds, pumping stations, substations, communications systems, and buildings and structures. Identify basic design problems that could result in significant environmental deterioration or a threat to the public safety during construction or during operation.

Task 4.1 Codes and Regulations

Review compliance of project design criteria and/or design with codes and regulations, identifying areas of noncompliance or where project description is absent.

4.1.1 Codes and ordinances.

4.1.2 Department of Transportation requirements.

4.1.3 OSHA regulations or guidelines.

Task 4.2 Hydraulics

Review applicant's basis for hydraulic design and optimization. Review system pressure profile for reasonableness.

Task 4.3 Piping Design

Review applicant's piping design criteria and/or designs of existing and new portion of the line for:

4.3.1 Assumed operating conditions, allowable stresses, and safety factors.

4.3.2 Flexibility to prevent excessive loading and overstressing the piping system or the supports.

4.3.3 Adequacy to resist seismic movement and forces including a dynamic analysis of the systems.

4.3.4 Design criteria and acceptability of tie-ins to existing transfer and distribution lines.

Task 4.4 Materials of Construction

Review applicant's design criteria and/or designs relating to the utilization of proper materials and fabrication of components to meet the working pressures and stresses to which the piping system will be subjected.

Task 4.5 Tank Design

Review applicant's design criteria and/or designs for tanks relating to:

4.5.1 Selection of design and construction specifications, standards, and tolerances of tanks and appurtenances.

4.5.2 Adequacy of tank and its foundation to resist seismic movement and forces including dynamic analyses.

4.5.3 Adequacy of emission controls for air quality.

Task 4.6 Structural Design

Review applicant's design criteria and plans relating to:

4.6.1 Anchors and supports.

4.6.2 River, rail, and highway crossings.

4.6.3 Dikes and walls.

4.6.4 Buildings and structures.

Task 4.7 Electrical

4.7.1 Review applicant's estimates of electrical loads and power sources for reasonableness. Confirm adequacy of power supplies.

4.7.2 Review applicant's specifications on electrical equipment with regard to resistance to seismic forces and other natural phenomena.

Task 4.8 Maintenance Provisions

Review applicant's plans for maintenance provisions including:

4.8.1 Preventative maintenance to provide reliability and safety.

4.8.2 Recording of seismic data at known fault areas.

4.8.3 Corrosion protection.

4.8.4 Slop oil handling.

Task 4.9 Piping Protection

Review applicant's design criteria and/or designs relating to:

4.9.1 Pipe coating, cathodic protection, and cathodic protection test stations to resist external corrosion.

4.9.2 Adequacy of provisions to resist internal corrosion to the system and proper consideration for corrosion allowance.

4.9.3 Water, rail, and roadway crossings, casings, seals, and insulators.

4.9.4 Physical damage.

Task 4.10 System Protection

Review applicant's plans relating to:

4.10.1 River crossing isolation.

4.10.2 Main line isolation.

4.10.3 Overpressure protection from surge and thermal expansion.

4.10.4 Energy dissipation at pressure let-down points.

4.10.5 Sabotage.

Task 4.11 Fire Protection

Review applicant's plans, design criteria, and designs regarding fire protection facilities at terminals, and pumping stations as they relate to applicable codes and recommended practices.

Task 4.12 Operating Surveillance and Control

Review applicant's plans relating to:

4.12.1 Terminal remote gauging and valve operation and overflow protection.

4.12.2 Custody transfer - meters and controls.

4.12.3 On-stream analyzers and surveillance devices, alarms, shutdowns, interlocks, remote mainline valve operation, redundant leak detection, computerized meter reconciliation.

Task 4.13 Communications

Review applicant's plans relating to:

4.13.1 Communications and supervisory control, redundancy, data transmission of line conditions from remote locations.

4.13.2 Reliability of communications systems.

4.13.3 Availability of carrying capacity in time-shared systems.

TASK 5.0 SAFETY REVIEW

Review procedures relating to safety of operations. Identify procedures (or lack of same) that could result in significant environmental deterioration or a threat to public safety.

Task 5.1 Operating Procedures

Review adequacy of applicant's proposed operating procedures for system startup, operation, and shutdown.

Task 5.2 Maintenance Procedures

Review adequacy of applicant's proposed maintenance procedures for safe isolation of and access to equipment and maintenance work.

Task 5.3 Fire Protection Procedures

Review adequacy of applicant's proposed fire protection procedures and methods for terminals, pumping stations, and along route.

Task 5.4 Emergency Procedures

Review adequacy of applicant's emergency procedures in handling of leaks, operating malfunctions, material hazards, or external causes.

Task 5.5 Power Interruptions

Review applicant's plans for accommodating local or general power interruptions on pump drivers, lighting, and communications facilities.

Task 5.6 Congested Area Construction

Review plans for investigation, surveillance, safety provisions, scheduling, and traffic control for pipeline construction in congested areas.

TASK 6.0 FAILURE MODE AND EFFECTS

Perform reliability and failure mode and effects analysis, including potential failure of the project's components due to internally generated hazards (mechanical failure, fatigue, corrosion, etc.), differences or errors in operating procedures, or to natural hazards (earthquake shaking, fault rupture, loss of support due to scouring from flooding, landsliding, volcanic activity, subsidence, winds, dust storms), and other external causes such as riot or sabotage.

Task 6.1 Terminals

Based upon applicant's functional flow diagrams and specific equipment components, develop a qualitative fault tree diagram for the Hynes or Midland terminal. Consider internal and external causative elements. (This analysis will not include a mathematical analysis based upon probability theory nor a rigorously calculated impact factor weighting frequency of occurrence with the magnitude or seriousness of the event. There are insufficient data to make such a statistical analysis.)

Task 6.2 Pumping Stations

A similar fault tree diagram will be prepared for a typical pumping station.

Task 6.3 Pipeline

A similar fault tree diagram will be prepared for a typical pipeline section, itself.

TASK 7.0 UNAVOIDABLE ADVERSE IMPACTS

Identify and delineate project impacts adversely affecting the environment which would be difficult or impossible to avoid by changes in design or operating procedure.

TASK 8.0 MITIGATING MEASURES

Summarize mitigating measures planned by applicant. Identify areas where measures not taken by applicant could result in lessened impacts.

PREPARATION PLAN
FOR
GEOTECHNIC EVALUATION REPORT
DATA SOURCES

Periodicals and Bulletins

Oil & Gas Journal
Hydrocarbon Processing
Pipeline & Gas Journal
Plant Engineering
National Fire Protection Association

Publications

U. S. Department of Commerce National Technical Information
Service Publication TID-7024, August 1963, Nuclear Reactors
and Earthquakes
M. W. Kellogg Company Design of Piping Systems
R. J. Roark Formulas for Stress and Strain
M. Hetenyi Beams on Elastic Foundations
Blaw-Knox Company Design of Piping for Flexibility
API Publication 2021, Guide for Fighting Fires in and Around
Petroleum Storage Tanks
American Institute of Steel Construction, Manual of Steel
Construction

Proceedings

American Petroleum Institute
National Association of Corrosion Engineers
National Petroleum Refiners Association
Western Gas Processors and Oil Refiners Association

Proceedings (Continued)

American Society of Mechanical Engineers

National Fire Protection Association

American Gas Association

Standards and Codes

ANSI B31.4, Liquid Petroleum Transportation Piping Systems

ANSI B16.5, Steel Pipe Flanges and Flange Fittings

ANSI B16.9, Steel Butt Welding Fittings

ANSI B31.1, Sec. 121, Design of Pipe Supporting Elements

API RP 1102, Recommended Practice for Liquid Petroleum Pipelines Crossing Railroads and Highways

API Std 1104, Standard for Welding Pipelines and Related Facilities

API RP 1107, Recommended Pipeline Maintenance Welding Practice

API RP 1110, Recommended Practice for Pressure Testing of Liquid Petroleum Pipelines

API RP 500C, Recommended Practice for Classification of areas for Electrical Installation at Petroleum and Gas Pipeline Transportation Systems

Hydraulic Institute Standards for Centrifugal Rotary and Reciprocating Pumps

NFPA 30, Flammable and Combustible Liquids Code

NFPA 70, National Electric Code

NFPA 11&11B, Foam Extinguishing Systems

NFPA 12A&B, Halogenated Extinguishing Agent Systems

NFPA 20, Centrifugal Fire Pumps

American Water Works C-203-73, Standard for Coal Tar Enamel Protective Coatings for Steel Water Pipe

Standards and Codes (Continued)

American Welding Society Standard D109.9, Standard for Qualification of Welding Procedures and Welders for Piping and Tubing

American Society for Testing and Materials Applicable Material Standards

Project Information

Design and Construction Information on Seismic Considerations, Hydraulics, Piping Systems, Pumps, Storage Tanks, Materials of Construction, Foundations and Structures, Electrical, Controls Communications, Operations Surveillance, and Maintenance of the Facilities Provided by Williams Brothers Environmental Services.

Data on the Existing Natural Gas Pipeline and its Utilization From Williams Brothers Environmental Services, Southern California Gas Company, and El Paso Natural Gas Company.

Miscellaneous

Environmental Impact Report, New England Energy Company Refinery and Pipeline, Alyeska Pipeline, Paktank Pacific Company Terminal

Oil Insurance Association General Recommendations for Tank Spacing

TASK	TOTALS
PLAN PREPARATION	72
TASK 1.0 OVERVIEW ANALYSIS	48
TASK 2.0 INFORMATION GATHERING	32
TASK 3.0 EVALUATE EXISTING PIPELINE	99
TASK 4.0 DESIGN REVIEW	538
TASK 5.0 SAFETY REVIEW	116
TASK 6.0 FAILURE MODES AND EFFECTS	100
TASK 7.0 POTENTIAL FOR ENVIRONMENTAL DAMAGE	36
TASK 8.0 UNAVOIDABLE ADVERSE IMPACTS	32
TASK 9.0 MITIGATING MEASURES	32
TOTALS	1105

PREPARATION PLAN
FOR
GEOTECHNIC EVALUATION REPORT

TASK COMPLETION AND MANPOWER SCHEDULE

<u>Task No.</u>	<u>Description</u>	<u>Completion Date</u>	<u>Manpower</u>
1.0	Overview Analysis of Applicant's Submission	7-2-76	48
2.0	Information Gathering	6-25-76	32
3.0	Evaluate Existing Pipeline	7-6-76	99
4.0	Design Review	8-13-76	538
5.0	Safety REview	8-20-76	116
6.0	Failure Mode and Effects	8-13-76	100
7.0	Unavoidable Adverse Impacts	8-20-76	68
8.0	Mitigating Measures	8-27-76	32

PREPARATION PLAN
FOR
GEOTECHNIC EVALUATION REPORT
TRAVEL

One Trip	J. Schulz to El Paso and Midland
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EDAW
PREPARATION PLAN
FOR
SOCIO-ECONOMIC ANALYSIS

INTRODUCTION

Each of the EIS sections dealing with socio-economic conditions and impacts will focus generally on similar: study area boundaries (i.e. political, jurisdictions, physical boundaries), socio-economic factors to be examined, methodologies to be applied and sources of information to be used.

The major sources of information anticipated to be used in this study have been organized by state and included as an appendix. These potential sources of information and bibliographic references should be consulted when reviewing the socio-economic work plan. The following work plan has been organized according to the EIS General Outline provided by the BLM.

A list of potential socio-economic factors to be examined is included as Table A. It should be noted that not all of these factors listed in Table A will be treated equally and/or be fully developed in this study. For example, economic base studies or regional input/output studies could be helpful in assessing socio-economic impacts of the terminal facilities and possibly some sections of new pipeline construction with respect to multiplier/growth-inducive impacts; however, such original research will not be undertaken by EDAW for this study. EDAW will, therefore, rely on available data for the purposes of describing socio-economic conditions and developing the subsequent impact analyses.

Preliminary review of available data indicates that sufficient information will be available for developing a comprehensive socio-economic study.

Not all the social factors listed in Table A are equally important and many are incapable of quantitative analysis. Some are not directly related to the environmental impact of a facility at a specific site, but nearly all are intuitively deal with. The social factors are generally more important where construction impacts occur in rural environments. The actual determination of the relative importance of various factors will be made through field surveys and interviews with appropriate public and private individuals. Many communities affected by the project have already examined employment and related economic issues in preparation of their own general plans, revenue sharing applications, capital improvement programs and economic development programs. A further review of already-collected census data and state-collected information will assist the development of regional, community and project profiles to give a picture of base conditions and indications of future trends related to the pipeline/terminal system. However, the major socio-economic factors anticipated to be covered in the study are employment, income, housing, population, and general economic activity (including retail sales activity, demand for services, tax and revenue flows, etc...). Direct and indirect (or induced) effects of the project will be stressed with respect to both the long and short term time periods. Coverage of other socio-economic factors as noted in Table A will be developed as is feasible. Coordination with RBA on socio-economic factors as they relate to the refining/petrochemical industry will be made to insure that the necessary

inputs are obtained for the study.

As noted above, the specific factors to be covered by segment, terminal, or other defined scope will depend upon an analysis of what the critical socio-economic factors are in each of these locations. This critical factors analysis will likely be summarized in the form of a matrix describing the coverage of each area (see attached titled graphic exhibits), and provide the EIS reader with an immediate identification of critical issues for each situation, for which more extensive information would be provided in the text. In short, the emphasis of the entire socio-economic analysis will be focused upon areas and subjects of obvious major impacts for the EIS including:

- terminal construction locations,
- construction/reconstruction segments of the pipeline,
- communities/regions within which the above activities occur.
- maintenance bases and adjacent communities or regions which could be expected to supply goods and services to these and other operational bases for the pipeline (other than terminal locations).
- communities which would serve as "staging" bases for construction activities along the pipeline providing housing, services, materials, etc.

EDAW's preliminary review of the EIA identified the following list of spatial areas of analysis:

A. Major New Terminal Areas:

Long Beach (includes both site and SMSA)

Midland (includes both site and SMSA)

B. New Construction Segments:

Pier J to Walnut

Walnut to Beaumont

Desert Center to Ehrenberg

Livingston to Hope

Jal to Midland

C. Potentially Affected Communities:

California

Long Beach

Redlands

Riverside

San Bernardino

Indio

Desert Center

Blythe

Arizona

Ehrenberg

Avondale

Buckeye

Phoenix

Tucson

Coolidge

Florence

La Palma

Randolph

Stanfield

New Mexico

Lordsburg

Denning

Las Cruces

Loving

Carlsbad

Jal

Texas

El Paso

Midland-Odessa

The work will focus to a large degree on these same spatial areas of investigation.

The following assumptions have been developed with respect to time periods which may be considered in the study:

- Historical Trends - The period 1960-1975 will be utilized for recent trends where possible, otherwise 1960-1970 or other "most recent" near term dates such as 1971, 1972, 1973, 1974. Where data can be reasonably interpreted using experience and judgement, a "most recent" near term date set of statistics will be derived, if critical to the study effort at that point. Recommendations and judgements from other entities (planning agencies, economic research entities, etc.) on such interpolations will be sought where necessary.

- Construction Impacts Years: In order to properly assess the socio-economic impacts of construction, it is necessary to include three phases of effect:
 - (1) Anticipatory/Planning - in which various communities, regions, entities, "gear up" in anticipation of potential impacts and effects, real or perceived. This phase is seen as mid 1976 - early 1977.
 - (2) Actual Construction - this phase is seen as lasting from late 1977 through 1978, and possibly into early 1979 for locations such as the Midland Terminal and possibly the Long Beach/Southern California areas.
 - (3) Construction "Wind-down" - this phase is expected to occur generally through 1979, ranging of course by location.
- Operational Impacts Years: The first effective year of operation for socio-economic analysis purposes is assumed to be 1980, with the long range projection year being 2000. Where possible/desirable/necessary, intermediate projection years will be utilized, most probably 1990, with possible 1985 and 1995 usage.

The additional assumptions which will be utilized will be described within the various analyses, particularly where assumptions developed by other agencies are directly adopted for the EIA (i.e. SCAG, other regional planning agencies).

2.1.16.2 Long Beach Area

This section will provide a description of the socio-economic conditions within the Long Beach area. It is required since both terminal facilities development and pipeline construction activities will occur in this area. Similarly during the operational phase of the pipeline some of the necessary management and maintenance activities will be centered here.

Preliminary work indicates that a large number of relevant secondary data sources exist. These sources of socio-economic data are listed in the appendix. The relevant data in these documents will be reviewed and synthesized to develop a concise profile of the socio-economic conditions within the Long Beach area and the region.

The description of the Long Beach area will include its relative position on a national/international scale as a port and processing/refining/distribution center. The Bureau of Economic Analysis, Los Angeles BEA region data and boundaries (nine Southern California counties) will be presented to describe the major regional setting and prepare the reviewer for comparable projections in other sections of the EIS.

The BEA data will be supplemented by U.S. Census data, State of California Agency information, and the studies conducted by the Southern California Association of Governments (SCAG-5 counties). The SCAG-76 growth policy studies and the economic studies by Los Angeles, San Bernardino and Riverside County Agencies as noted in the appendix, will provide current information required for this work.

In addition, the William Brothers EIA contains a great number of relevant tables which will be updated and revised as needed. Many of these basic data tables will be contained in a technical appendix to the socio-economic section. Graphics, where appropriate, (see attached illustrative graphic examples) will be used to facilitate the clear and concise presentation of socio-economic information.

Since socio-economic data are dynamic, recent trends will be used to describe the setting as a dynamic condition. (Longer range projections are detailed in other sections of this outline.) Coordination with RBA with respect to direct and indirect employment related to Long Beach area development will take place at this stage of the work program.

Completion Schedule:

- Research/analysis completed June 21, 1976
- Rough draft completion June 25, 1976
- Final draft completion July 1, 1976

2.1.16.3 Pipeline Route

The socio-economic setting along the pipeline route will require the identification and description of a variety "spheres of influence" from the larger BEA analysis area down to local areas around specific system facilities.

The BEA areas are to be used to delineate the overall socio-economic setting along the pipeline and provide a basis for comparison between areas. Graphics will supplement text and tables wherever possible. A rigid (i.e. 5 mile or 10 mile) corridor width is considered inappropriate for purposes of presenting the socio-economic characteristics of populations along the pipeline route. Socio-economic study areas along the pipeline will fluctuate to account for inhabited areas, transportation access and other features. Where construction and operation employment is an issue (construction segments, terminals, maintenance bases), the study area may likely expand. However, it should be noted that socio-economic variables may not be treated equally for these wider spheres of influence. The depth to which such variables are treated will be dependent upon their overall importance to assessing the potential socio-economic impacts of pipeline development. The SOHIO-EIA socio-economic information is generally based on U.S. Census information. It is comprehensive, but unstructured with respect to the communities and regions within clearly defined primary/secondary impact areas. CEQ guidelines and subsequent interpretations of the EIS process specifically focus on directed interpretation of raw data within clearly defined impact areas with the rationale for definition of these areas required to be clearly spelled out. The strip-mapping provided in the SOHIO-EIA is at variance with what the physical zones of impact would be, much less the socio-economic impacts. Appropriate changes will be made for the purposes of this study. In short, the areas of socio-economic impact of the pipeline project will be defined as part of this sub-task.

In order to adequately assess short and long term impacts of the project and develop reasonable mitigation measures socio-economic data must be desegregated by potential areas of impact. The data can then be analyzed and provide a sound basis for describing socio-economic baseline conditions along the pipeline route.

Completion Schedule:

Same as 2.1.16.2

2.1.16.4 Midland Area

The Midland terminal is expected to have a relatively greater socio-economic impact on its surroundings than other project components.

It is believed that project construction and operation personnel will significantly affect the general economy of the Midland terminal area directly and by inducing supporting development. Therefore, the socio-economic setting of the Midland area will receive more attention than the pipeline route (even where new pipeline construction is taking place). Specifically, many of the socio-economic factors identified in the introduction will be addressed in this section.

Coordination with RBA with respect to direct and induced employment at Midland will take place at this stage.

Completion Schedule:

Same as 2.1.16.2

2.1.16.2 Long Beach Area

The future environment without the project will principally be developed from regional growth projections which have been made by other agencies and organizations. These available projections will be evaluated for consistency and credibility. The BEA analysis areas are only generally appropriate in this case. In the Long Beach area, a number of other secondary references will be used for this study. These will include population projections and policy statements prepared by the State Department of Finance, the State Office of Planning and Research, the California Coastal Commission, and the State Department of Transportation.

Regional agencies from which such current available information will be obtained include the Southern California Association of Governments and the Los Angeles County Regional Planning Commission. The appropriate city offices and port authorities of Los Angeles and Long Beach will also be consulted as well as the other localities directly affected by the project.

Information on local and regional economic trends, employment data and various projections of socio-economic factions will be obtained from U.C.L.A., U.S.C. and Economic Research Sections of Banks.

It has been determined that data at the federal level (other than BEA) will not be available for the usual socio-economic projections. However, petrochemical industry and refining projections affecting Long Beach (and in some cases, the nation), will be developed by RBA to integrate with the other population-related projections. These would include direct employment, income and other factors.

Completion Schedule:

Same as 2.1.16.2

2.2.16.3 Pipeline Route

It is expected that the future of communities along the pipeline route will be less affected by the implementation of the pipeline in comparison to the effects upon the terminals. Population projections by various regional agencies will form the primary basis for describing the future socio-economic environment without the project. These projections will also be used in assessing potential impacts related to the development of the pumping stations along the pipeline route.

The communities and maintenance stations, will receive additional attention since the project could, to a minor extent, affect the short range economic picture of some smaller communities.

Completion Schedule:

Same as 2.1.16.2

2.2.16.5 Midland Area

The attempt to quantify the future of the Midland area without the project will be based primarily on state and regional plans and projections. Sources used in the environmental setting section with the project and listed in the appendix will be used to describe future conditions without project. (In reality, the analysis setting and the future without the project will be handled at the same time, wherever possible.)

Again, coordination with RBA energy/petroleum related inputs in terms of direct employment, income and supportive services will be necessary for this section.

Completion Schedule:

Same as 2.1.16.2

3.1.16.2 Long Beach Area

The socio-economic impacts of construction and operation on the Long Beach terminal and surrounding area is anticipated to be relatively slight because of the large, diverse, metropolitan character of the population and labor force. Impacts can be expected to be diffused through the regional area and not restricted to the Long Beach area proper. Since unemployment is presently high in California across a broad spectrum of categories, it is reasonable to assume that the labor supply will be adequate. However, if we find that other planned projects require many of the same disciplines as the Sohio project, it may be necessary to restate these positions with respect to potential cumulative impacts associated with this project.

The impact on public service costs and revenues will be determined at this stage and can be expected to be considerable (multiplier effects will be considered in the cumulative impacts section). Judgement will be used in allocating workers and their families in the Long Beach area. It is anticipated that exact quantification of workers by place of residence will not be possible.

Graphical presentation may be used to help describe relative impacts of various factors (i.e. comparisons of governmental costs and revenues, etc.)

It is assumed that the construction/operation employment and machinery/resource utilization data will be contained in the Description of the Project in the EIS as in the EIA. Whether a graphic presentation of this data will also be appropriate in the Impacts Section will be examined as employment and income information related to route segments and terminals is more thoroughly analyzed.

Completion Schedule:

- Impact causes research/analysis complete July 7, 1976
- Impact causes rough draft complete July 8, 1976
- Impact causes final draft complete July 9, 1976
- Impact evaluation research/analysis complete August 6, 1976
- Impact evaluation rough draft complete August 13, 1976
- Impact evaluation final draft complete August 19, 1976

3.1.16.3 Pipeline Route

The major impacts of the pipeline construction will be developed with respect to the socio-economic factors previously described. Because of the relative differences between types and magnitude of impacts a matrix format may be used in order to summarize and compare the major impacts of the project on the socio-economic environment. For example, a matrix of towns and other locations with various socio-economic factors would show the presence and criticality of these factors, by locale, at a glance. This matrix approach will be developed for pipeline segments on either a single impact subject or major socio-economic setting issue basis. For example:

- Distance from nearest town? (construction, base, materials)
- Quality of access? (Time, average speed, mode)
- Adequate supply of housing for construction crews?
- Capacity of existing public and private services?
- Quality of labor pool? (availability of skilled, unskilled labor)
- Likelihood of construction work force commuting from major metropolitan areas?
- Relocation and other disturbances?
- Provision of new establishments/employment necessary? (or higher sales for existing)

Impacts will be described in terms of their local nature. These impacts will also be compared relative to other pipeline segments. The extent of impact will be dependent on the extent and timing of the construction and operations phases. Sufficient information on the locations of construction bases and maintenance stations is not included in the EIA and will be required in order to avoid a generalized impact analysis.

The EDAW methodologies referred to as "Vidal" and "CIAM" will be applied as appropriate for the purposes of describing potential socio-economic impacts. The Vidal "model" is a methodology developed for measuring net short and long-term changes to various critical indicators of small community economic conditions resulting from the impacts of construction and operation of the major nearby facilities. It can be used to assess impacts on communities serving as a regional bases of operations for construction and later operations activities.

Socio-economic factors considered in this methodology are: employment, retail sales, material purchases, payrolls, critical unemployment skills, etc. Outputs included: employment impacts on key groups, revenue effects on local retail operations, municipal services, etc.

This methodology is expected to be particularly useful in describing potential socio-economic impacts in the Blythe-Ehrenberg area, Jal, and other small communities within an anticipated region of demand for local employment and services.

CIAM is a corridor analysis methodology and data resource base. It is derived from an impact analysis methodology developed originally for an EIS on a 900-mile pipeline. Input for the socio-economic portions of CIAM would be: demographic and employment information for the selected corridor, corridor widths or zone limits for primary and secondary impacts, and base and projection years. Outputs would be: net changes in employment, and income and related secondary impacts by time period and location along the selected corridor or within the designated zone of influence. ("CIAM" refers to Corridor Information and Analysis Methodology.) This methodology will also be used as appropriate to assess the potential socio-economic impacts of the project on the pipeline corridor.

Completion Schedule:

Same as 3.1.16.2

3.1.16.4 Midland Area

The same factors of impact as for Long Beach will be treated at the Midland terminal to determine impact. Again, since impacts could be relatively higher here, more attention will be paid to their analysis and presentation. Particularly, attention will be focused on assessing changes in direct and indirect employment and income related to the construction and operation of the project with respect to both the city of Midland and the Midland-Oderra SMSA.

The eighteen-month duration of construction in Midland provides a much more stable base for significant primary and secondary employment and income changes and may enable some positive economic planning related to operational impacts of the terminal facility to be accomplished.

Sources to be contacted concerning these critical issues are described in the accompanying source appendix, and would include economic development and monitoring entities.

Completion Schedule:

Same as 3.1.16.2

3.2.16.2 Long Beach Area

Cumulative socio-economic impacts are often difficult to define consistently--especially if projected 20 to 30 years into the future as required by this study. In the Long Beach area, there may be few "real" cumulative impacts because of the ability of the large Los Angeles-Long Beach metropolitan area to absorb the impact of even major projects such as that proposed in this EIS.

Traditionally, a multiplier has been used as an indicator of potential cumulative impacts (or secondary impacts). The EIS used the so-called Casa Grande multiplier which is not appropriate to this area, or to the Midland area. Interviews with university research sources, as well as bank and government economists, will provide a range of possible multipliers attributable to the project. It is probable that directly relevant multipliers and related indicators may not be available and may have to be derived.

Long-term effects on related private growth and public services attributed to the project will be assessed. This will be accomplished by analyzing available data, interviews with knowledgeable officials, and coordination with RBA (on petrochemical industry impacts).

Other Long Beach area impact questions to be addressed include: How will the economic/employment impacts (both direct and indirect) of the proposed Long Beach Terminal relate to the proposed major expansions for commodity handling and trade activities (and related economic sector changes) of both Long Beach and Los Angeles Harbors? For example, could there be a "synergistic" effect in which the implications of major petroleum related economic activity increases in overall port and region industrial economic sector activity would combine with proposed Los Angeles/Long Beach cargo handling expansion activities to produce significant changes in the regional economy related to the port areas? Is this wishful thinking, or could it represent a significant long-term effect deserving in-depth discussion in the EIS? How should the port facilities coordinate planning and impact mitigation?

Complete Schedule:

Same as 3.1.16.2

3.2.16.3 Pipeline Route

Cumulative socio-economic impacts along the pipeline route will be primarily of short duration and the result of construction employment, with some possible minor cumulative impacts from any operations or mobile personnel connected with the pumping and maintenance stations. Precise economic multipliers may not be available or even applicable considering the relatively minimal nature of such impact. Where operations and maintenance bases are expected to create demand for goods and services within a region, this will be noted.

Complete Schedule:

Same as 3.1.16.2

3.2.16.4 Midland Area

Specific regional socio-economic multipliers will have to be obtained or derived for the Midland area. Interviews with knowledgeable local officials, contact with economic indicator research entities, and review of available secondary sources of such information is expected to yield these multipliers.

The cumulative impacts in the Midland area are expected to represent the largest relative cumulative impact in terms of potential for change of any location on the pipeline/terminal system.

Completion Schedule:

Same as 3.1.16.2

4.1/4.2 Mitigation Measures Not Included In Proposed Action

Mitigating measures relating to socio-economic impacts may include a wide range of policy alternatives by federal, state and other entities. These could include such issues as a local public relations effort to ensure that local labor and material suppliers will be in a position to benefit from the project through supplying its needs, how, when and where needed. Regional policies to ease unemployment by providing jobs for skilled and unskilled local workers could be implemented, particularly using federal programs where possible.

Much of the construction outside of the Southern California region is dependent upon labor imported into economically depressed areas (in terms of unemployment levels). The EIA indicates that there will be short-term benefits from local income expenditures by pipeline workers, and some regional capture of materials expenditures. It does not, however, address the potentials of consciously planning for and seeking local/regional work force skills and materials as feasibly possible for major segments of the route construction effort. Current federal policies with respect to employment-generating major "federal" projects (the BLM EIS signifies that this is one of these) stress that such planning efforts must be undertaken to insure that any decision to utilize major import labor/materials has been arrived at after a careful, in-depth consideration of local/regional resources.

Accurate and timely information about the project's potential socio-economic impacts may be the best mitigating measure because local officials and administrators will be better able to cope with the temporary changes that are mainly involved.

It is expected that other mitigating measures will be more obvious during the EIS project work phase.

Completion Schedule:

- Mitigation measures research/analysis complete August 27, 1976
- Mitigation measures rough draft complete September 3, 1976
- Mitigation measures final draft complete September 10, 1976

5.2.8.2 Long Beach Area

Adverse socio-economic impacts which cannot be avoided may include both direct and cumulative impacts in the Long Beach area. These could include relocation of any homes or businesses, disruption of any commercial or industrial activity during construction, and any public fiscal impacts where government costs exceed revenues. As noted earlier, the latter fiscal impacts may be difficult to pinpoint accurately because of the ability of the Los Angeles-Long Beach area to absorb most potential impacts through its tremendous population-employment-resource base.

Completion Schedule:

- Adverse impacts research/analysis complete August 27, 1976.
- Adverse impacts rough draft complete September 3, 1976
- Adverse impacts final draft complete September 10, 1976

5.2.8.3 Pipeline Route

Adverse unavoidable impacts along the pipeline route will be similar to those discussed under 5.2.8.2. A matrix combined with map format should be the best way to treat these impacts since, with few localized exceptions related to the construction areas, minimal socio-economic impacts are currently anticipated for major portions of the pipeline route.

Completion Schedule:

Same as 5.2.8.2

5.2.8.4 Midland Area

Adverse unavoidable socio-economic impacts in the Midland area can be expected to be similar to those mentioned in 5.2.8.2, but may be susceptible to more accurate placement because of the relatively more definable nature of the economic region. As with other sections referring to Midland, more information will be needed than that prepared in the EIA and much of the detail of documentation of unavoidable impacts will be dependent upon the ability to project these adverse impacts with respect to known levels of socio-economic factors within the region. At this time, the amount, reliability and availability of this information is not totally clear due to its almost total lack of coverage in the EIA. Detailed interviews and contacts with local officials and research entities will be required.

Completion Schedule:

Same as 5.2.8.2

8.0 ALTERNATIVES TO PROPOSED ACTION

8.2 TERMINAL ALTERNATIVES

A generalized comparative analysis of potential alternative terminal points as outlined in the EIA will be performed using the available data. It will include the proposed alternative west coast terminals and inland terminals as well as the impacts resulting from no project. The significant impact differences between the urban metropolitan terminal proposed for the Long Beach-Midland route and those proposed for the non-urban alternative locations would be discussed, particularly with respect to employment, community services and housing.

As these alternative non-urban terminal locations would present major primary and secondary socio-economic impacts, their comparison with the proposed route will be described in more precise quantitative terms than the relative terms utilized in the EIA, to the extent that available quantitative data exists.

Generally, the same types of socio-economic factors will be examined for the alternatives as for the proposed project, but at a broader scale, using matrix formats with less statistical support than the "proposed action" alternative. Coordination with RBA will be critical in this task when assessing the relative capability of the alternate locations to provide necessary skilled construction and operational employment.

Completion Schedule:

- Alternatives research/analysis complete August 27, 1976
- Alternatives rough draft complete September 3, 1976
- Alternatives final draft complete September 10, 1976

SUMMARY OF TOTAL HOURS BY WEEK

<u>(A) EXISTING ENVIRONMENT</u>	<u>TOTAL HOURS</u>
Week of June 14-18, 1976	140
Week of June 21-25, 1976	180
Week of June 28-July 2, 1976	<u>240</u>
TOTALS	560
<u>(B) IMPACT CAUSES AND ANALYSIS INCLUDING ADVERSE IMPACTS</u>	
Week of July 6-9, 1976	160
Week of July 12-16, 1976	160
Week of July 19-23, 1976	160
Week of July 26-30, 1976	200
Week of August 2-6, 1976	200
Week of August 9-13, 1976	180
Week of August 16-20, 1976	<u>160</u>
TOTALS	1220
<u>(C) MITIGATION MEASURES/ALTERNATIVES</u>	
Week of August 23-27, 1976	110
Week of August 30-September 3, 1976	110
Week of September 7-10, 1976	<u>110</u>
TOTALS	330

TABLE A

LIST OF SOCIO-ECONOMIC FACTORS

- a. Population & Demographic
 - 1. Population size of impacted areas (primary and secondary)
 - 2. Population by area
 - 3. Population density by area
 - 4. Distribution of population
 - 5. Racial/ethnic characteristics
 - 6. Age and Sex distribution
 - 7. Birth, death & net migration rates
 - 8. Family size
 - 9. Educational levels
- b. Income
 - 1. Income by area, per family, per capita
 - 2. Income distribution (median income, poverty levels, income classes)
 - 3. Cost of living
 - 4. Opportunity for change or increase in income
 - 5. Second incomes, working wives, overtime pay
- c. Housing
 - 1. Supply of housing by type and area
 - 2. Cost of housing by type and area (includes rent)
 - 3. Quality of housing by type and area
 - 4. Vacancy rates

5. Ownership, tenure, occupancy levels
 6. Matching income to housing costs
 7. Dislocation and relocation of families
 8. Interactions with new neighbors, isolation from friends and relatives, unfamiliar surroundings for new and displaced residents
 9. Ability to afford new housing and any subsequent changes in the life style expenses.
 10. Opportunity for changes in housing supply and provision of related community facilities and services.
 11. Discriminatory practices.
 12. Supply of transient housing, mobile homes, motels.
- d. Labor Force and Employment
1. Total number by area
 2. Employee distribution by categories
 3. Labor force participation rates
 4. Number of establishments by major SIC categories
 5. Size of major firms by number of employees, dollar volume, acreage and gross floor area.
 6. Quality of the major firms or industry (static, declining, advancing, "desirable", labor-intensive, etc.)
 7. Distribution of firms
 8. Unemployment by numbers, categories and distribution
- e. Economic Activity
1. Supply and demand for relevant resources, e.g., lumber, sand and gravel

2. Governmental costs and revenues (fiscal impacts)

Major cost categories include:

Education

Health

Welfare

Public Safety (Police, Fire)

Utilities

Major revenue categories include:

Property Taxes

Sales Taxes

Franchise & Business Taxes

Possessor Interest

Income

Motor Vehicle

Hotel/Motel

3. Economic base studies where available (also input-output and similar regional economic studies)

4. Multiplier and accelerator effects as determined by available secondary data and interviews

5. Commercial supporting services

6. Energy and fuel requirements for pumping plates and similar facilities (RBA)

f. Socio/Cultural Factors

1. Stability of population

2. Mobility

3. Psychosociological needs, such as privacy, independence, need for social interactions

4. Security, convenience, comfort, amenities

g. Stress Indicators

1. Crime
2. Welfare
3. Unemployment
4. Racial integration, segregation
5. Health
6. Drug Abuse
7. Quality of services (e.g., garbage collection, street maintenance, child care services)

h. Participation in community control

1. Community involvement
2. Interest groups
3. Local media
4. Physical obstacles to community interactions

i. Perception

1. Community image, ambience
2. Perception of available opportunities
3. Desire to remain within community
4. Perception of conflicts
5. Vulnerability of local populations (differences in perception and need among income or racial classes)
6. Perception of risks and uncertainty

j. Cultural Facilities

1. Cultural facilities available
2. Distance, time and cost related to cultural facilities

1. Institutional

1. Political constraints and opportunities
2. Legal constraints and opportunities
3. Administrative constraints and opportunities
4. Organizational realities by area, agency, responsibility,
public and private
5. Relationship to community goals and objectives as
expressed in general plans, capital improvement programs,
economic development programs and the like

SOURCE APPENDIX

(Note: In addition to the EIA, the following sources of information will be reviewed in detail with respect to their applicability to this study. All data used in the study will be appropriately referenced).

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RBA
PREPARATION PLAN
FOR
SOCIO-ECONOMIC EVALUATION REPORT
TASK DESCRIPTION AND METHODOLOGY

TASK 1.0 OVERVIEW ANALYSIS OF APPLICANT'S SUBMISSION

Additional available information on the project will be obtained from the applicant and reviewed in detail to obtain a better understanding of the project.

TASK 2.0 INFORMATION GATHERING

Relevant data will be collected. It is anticipated that the following data sources will be used as a minimum to develop information necessary for the accomplishment of Tasks 3.0 through 7.0.

Periodicals

Oil & Gas Journal

Oil Daily

Petroleum Economist

Hydrocarbon Processing

Pipeline & Gas Journal

Chemical Engineering Progress

API Weekly Statistical Bulletins

Proceedings

American Petroleum Institute

National Petroleum Refiners Association

Western Gas Producers & Oil Refiners Association

American Gas Association

Direct Contacts and Private Sources

Substitute Natural Gas Committee - American Gas Association

Operating Committee - American Petroleum Institute

Long Beach/Los Angeles Refining and Petrochemical, Transportation,
and Terminal Industry Personnel

Midland Area Refining, Petrochemical, Transportation, and
Terminal Industry Personnel

Utility Companies in the Long Beach/Los Angeles Area, the Pipeline
Route Area, and the Midland Area

Contact With Governmental Agencies

California PUC, San Francisco and Los Angeles

California Energy Resources Conservation and Development
Commission, Sacramento and Los Angeles

California Coastal Zone Commission, South Coast-Long Beach and
San Francisco

Federal Power Commission, Washington, D. C.

Federal Energy Administration, Washington, D. C., and Sacramento

Department of Interior, Washington, D. C.

Project Information

Applicant's Basis for Increase of Refinery Utilization From
81% in 1974 to 90% in 1978-1979

Timing of Future Facility Capacity Expansion

Applicant's Schedule of North Slope Crude Production Rates

Miscellaneous

API Data Book

RBA District V Refinery Model

Oxford Petroleum Inc. Publication of Foreign Raw Material Sources

RBA Individual Refinery Models

Maps of Oil Handling Facilities, Los Angeles Harbor, Los Angeles and Orange Counties, Union Oil Company Drawings 4-5-1 Sheets 1 and 2 Revised 8/1/64

Applicant's References

California Department of Oil and Gas

California Gas Report, 1975

CPUC Rate Case Filings

AGA Supply/Demand Model

FPC Proceedings - El Paso, LNG, Arctic Gas

EIR, LA Harbor LNG

EIR, Port Hueneme LNG

FEA Sector Model

TASK 3.0 DESCRIPTION OF THE ENVIRONMENT

The objective of this task is to supplement the applicant's submission from the standpoints of existing energy supply and demand in the Long Beach/Los Angeles area, descriptions of existing refinery and petrochemical industries in the three areas of the project, descriptions of existing pipeline transportation facilities in the three areas of the project, and descriptions of existing utility networks and supplies in the three areas of the project.

Task 3.1 Transportation Networks

Using published pipeline maps and private industry sources, the existing crude oil and refined product pipeline transportation networks and approximate capacities will be described for the

Long Beach/Los Angeles area, the pipeline route area, and the Midland terminal area.

Task 3.2 Utility Networks

Utility supplies and networks in the three areas of the project will be described based upon discussion with personnel of the various utility companies involved.

Task 3.3 Socio-Economic Conditions

To verify and supplement applicant's submission, the existing energy supply and demand in the area of Long Beach/Los Angeles, pipeline route, and Midland terminal will be described.

3.3.1 RBA's existing PAD District V refining model will be updated to reflect latest crude mix information and validated against API reports. The model will then be modified to reflect new facilities currently under construction which will be completed in the 1976-1977 time period, and to indicate production of petrochemical feed stocks. The model will be reduced in scope to show Southern California refineries only. (The model will not reflect other conceivable alternates such as 700,000 BPD of Arco's North Slope crude.)

3.3.2 The existing refining and petrochemical industries in the area of the pipeline route will be described.

3.3.3 The existing refining and petrochemical industries in the Midland terminal area will be described.

3.3.4 Current gas supplies and usage in the Southern California area will be described.

TASK 4.0 FUTURE ENVIRONMENT WITHOUT THE PROJECT

The objective of this task is to supplement the applicant's submission by projecting those existing conditions developed under Task 3.0 to those without the project in a time frame of the year 2000. Energy supply and demand in the Long Beach/Los Angeles area, refining and petrochemical processing industries, pipeline networks, utility networks, and crude supplies and sources necessary to PAD District V will be estimated based upon existing predictions tempered by RBA's knowledge of probable local and PAD District V restrictions imposed by governmental agencies. (An analysis of energy, crude petroleum, and petrochemical feed stock demands and supply in other PAD Districts is not planned as a portion of this review.)

Task 4.1 Transportation Networks (2.2.13)

Using existing projections of petroleum and petrochemical usages of PAD District V, the existing RBA PAD District V Model will be modified and expanded to produce the projected product rates in Southern California. Raw material consumptions thus developed will be used to estimate necessary modifications of the pipeline networks without the project.

Task 4.2 Utility Networks (2.2.14)

Utility networks necessary without the project in the three areas of the project will be projected to the year 2000.

Task 4.3 Socio-Economic Conditions (2.2.15)

To supplement the applicant's submission, energy supply and demand will be projected to the year 2000.

4.3.1 The modified RBA PAD District V Model as outlined in Task 4.1 will be projected to the year 2000 and used to predict refining and petrochemical processing facilities in Southern California. A probable scenario relating to total liquid fuel demands, residual fuel sulfur requirements, petrochemical feed stock demands, total North Slope crude availability, Elk Hills crude availability, OCS crude availability, availability of low sulfur crude imports, California crude oil decline, resid desulfurization state-of-the-art, Coastal Zone construction attitude, etc., will be delineated. (The work plan does not, however, envision consideration of these alternate scenarios.)

4.3 2 Supply/demand forecasts to the year 2000 will be prepared based upon the following alternatives:

- "No Impact" Hypothesis.
- Arctic Gas Pipeline Approved.
- El Paso LNG Project Approved.
- Indonesia LNG a Major Source of Southern California Gas Supply.
- Arctic/Midwest Pipeline Project Approved.
- Permian Basin Reliance Due to Denial of Above Alternatives.

Face-to-face field interviews with responsible managerial-level staff of the following "Interactive Groups" will be conducted to determine their attitudes and policies towards the proposed pipeline conversion (both short and long-term).

- California Public Utilities Commission
- California Energy Resources Conservation and Development Commission
- California Coastal Zone Commission

- * Federal Power Commission
- * Federal Energy Administration
- * Department of Interior

Likely price trends for natural gas in light of these scenarios developed under the "Alternate Futures" above, and the attitudes and policies of the Interactive Groups will be described and analyzed. (We would not anticipate including in the work an examination of the effect on natural gas demand in Southern California of recent energy conservation efforts on the part of industry, the switch to alternate fuels such as coal, solar, propane, nuclear, and fuel oil, and the effect of recent electric utility decisions (e.g., Southern California Edison Company in Utah) to cancel coal-fired and/or planned nuclear power stations. Nor would we include an examination of "Other" Alternative Futures related to an emphasis on Coal Gasification, Propane Peak Shaving, and Off-Shore Drilling potential as supply sources rather than LNG or Arctic gas.)

TASK 5.0 EFFECT OF PROJECT UPON THE PRESENT ENVIRONMENT

The objective of this task is the description of the near-term effect of the project upon existing pipeline transportation networks, refining and petrochemical processing operations and markets, and utility networks in the Long Beach/Los Angeles area, the pipeline route area, and the Midland terminal area.

The models of existing refining and petrochemical processing facilities constructed for Task 3.0 will be modified to reflect the changes caused by the proposed project.

Task 5.1 Transportation Networks (3.1.13)

The near-term effect of the project upon existing transportation networks will be analyzed and described for the areas of Long Beach/Los Angeles, the pipeline route, and the Midland terminal. The methodology will include use of existing pipeline maps and discussion with local industry pipeline personnel.

Task 5.2 Utility Networks (3.1.14)

The applicant's estimates of various utility usages and means of supply will be verified. Sources of supply in the various areas will be verified by discussions with the personnel of the utility companies involved.

Task 5.3 Socio-Economic Conditions (3.1.15)

5.3.1 The models of the existing refining and petrochemical industries constructed in Task 3.0 will be modified to describe the changes caused by the supply of Alaskan crude to these industries in the three areas of the project by the project. (The possible simultaneous supply of Alaskan crude to these areas by means other than the project, and the effect of such additional supply, is not planned as a portion of this review.)

5.3.2 Near-term changes to gas supply and demand caused by the project will be superimposed upon the existing environment as described above in paragraph 3.3.1. Specifically, the potential effect of the proposed pipeline conversion will be evaluated. Both the near-term and the longer-term conversions will be considered.

TASK 6.0 EFFECT OF THE PROJECT UPON THE FUTURE ENVIRONMENT

This task will compare all items developed in Task 4.0 for the time frame of the year 2000 with those projected for this period with the project.

Task 6.1 Transportation Networks (3.2.13)

The necessary crude oil and refined product transportation networks and capacities necessary in the three areas of the project in the year 2000 with the project will be estimated and compared with the networks developed in Task 4.1.

Task 6.2 Utility Networks (3.2.14)

The necessary utility networks and capacities with the project in the three affected areas will be determined for the year 2000 and compared with those developed in Task 4.2.

Task 6.3 Socio-Economic Conditions (3.2.15)

6.3.1 The refining and petrochemical models developed in Task 4.3 for the year 2000 will be modified and expanded as necessary to incorporate changes caused by the project.

6.3.2 Projected gas supply and demand in the year 2000 developed for Task 4.0 will be modified for changes caused by the project and compared with the supply and demand picture for the year 2000 without the project.

TASK 7.0 UNAVOIDABLE ADVERSE IMPACTS

Task 7.1 Transportation Networks

The unavoidable adverse impacts of the project upon transportation networks in the three areas of the project will be described.

Task 7.2 Utility Networks

The unavoidable adverse impacts of the project upon utility networks in the three areas of the project will be described.

Task 7.3 Socio-Economic Characteristics

7.3.1 The unavoidable adverse impacts of the project caused by anticipated expansion and extension of refining and petrochemical processing facilities will be examined on an unmitigated basis.

7.3.2 The unavoidable adverse impacts of the project upon the fuel gas supply and demand in the Long Beach/Los Angeles area will be described and assessed.

RBA
PREPARATION PLAN
FOR
SOCIO-ECONOMIC EVALUATION REPORT

TASK COMPLETION SCHEDULE AND TOTAL PERSONNEL MANHOURS

<u>Task No.</u>	<u>Description</u>	<u>Completion* Date</u>	<u>TOTAL HOURS</u>
1.0	Detailed Analysis of Applicant's Submission	6-25-76	48
2.0	Information Gathering	6-28-76	80
3.0	Description of the Environment	6-25-76	116
4.0	Future Environment Without the Project	7-9-76	164
5.0	Effect of Project Upon the Present Environment	7-16-76	100
6.0	Effect of Project Upon the Future Environment	7-30-76	70
7.0	Unavoidable Adverse Impacts	8-20-76	68
TOTAL			680

*To EDAW.

EDAW
EXAMPLES OF GRAPHICS

(Note: The examples included in this section are for illustrative purposes only, and are intended to show the various types of graphic methods which may be utilized in illustrating various socio-economic factors. To a large extent, dependence will be made on existing graphic sources, both from the EIA and from other sources (Regional Planning Agencies, etc.) where clear, usable graphics are available to clearly illustrate major socio-economic elements (see SCAG examples for pop., income, etc.) All graphics adapted from other sources will be referenced. The base maps used to illustrate regional or local information would likely be the standard USGS maps used in the EIA, or from the USGS National Atlas. Overlays registered to such base maps and suitable for development of camera ready graphics by BLM will be developed).

IMPACT SOURCES		DIRECT IMPACTS						INDIRECT IMPACTS		
		Franchises and Leases	Mineral Resources	Natural Resources	Community Services	Infrastructure	Local Economic Output			
CABLE SYSTEM COMPONENTS (Physical Presence)	Cables, Cords or Ducts									
	Cable Trenches									
	Cable Structures									
	Cable Underwater									
	Termination - Existing Stations									
	Termination Stations - New (HVAC)									
	Manholes									
	Reactions - Existing Stations									
	Reactions Stations - New (HVAC)									
	Reactions Stations - New (HVAC)									
	Reactions Stations (HVAC) (type)									
	Reactions Stations (HVAC)									
PRECONSTRUCTION PLANNING	Right-of-Way Acquisition - Public Lands									
	Right-of-Way Acquisition - Private Lands									
CONSTRUCTION	Site Investigation - Review of Existing Improvements									
	General Construction - Equipment Operation									
	General Construction - Labor Force									
	General Construction - Disposal of Wastes									
	General Construction - Operation Methods									
	General Construction - Operation Methods - Changing									
OPERATION AND MAINTENANCE	Operation									
	Operation and Maintenance									
	General Operation - Energy Transmission									
	General Operation - Personnel Labor Force and Payroll									
	General Operation - Taxes and Fees									
	General Operation - Transportation Expenses (HVAC & HVDC)									
	General Operation - General Inspection Expenses									
	General Operation - General Expenses									
CHANGES IN OTHER ENVIRONMENTAL CONDITIONS (INDIRECT SOURCES)	Earth Resources - Mineral Resources - Mineral Extraction									
	Water Resources - Water Quality - Chemical Quality									
	Land Use & Cultural Patterns - Land Use - Existing Land Use									
	Land Use & Cultural Patterns - Land Use - Land Use Quality									
	Land Use & Cultural Patterns - Land Use - Land Use Quality									
	Land Use & Cultural Patterns - Land Use - Land Use Quality									

ECONOMIC & COMMUNITY RESOURCES

IMPACT LEGEND

- ☐ Short-Term
- ☐ Long-Term
- ☐ Either Short or Long or both
- ☐ Accidental Cause
- ☐ Low probability of Occurrence

Figure 6-27. Economic & community resources impact matrix

URBAN-SUBURBAN SCENARIO SUMMARY

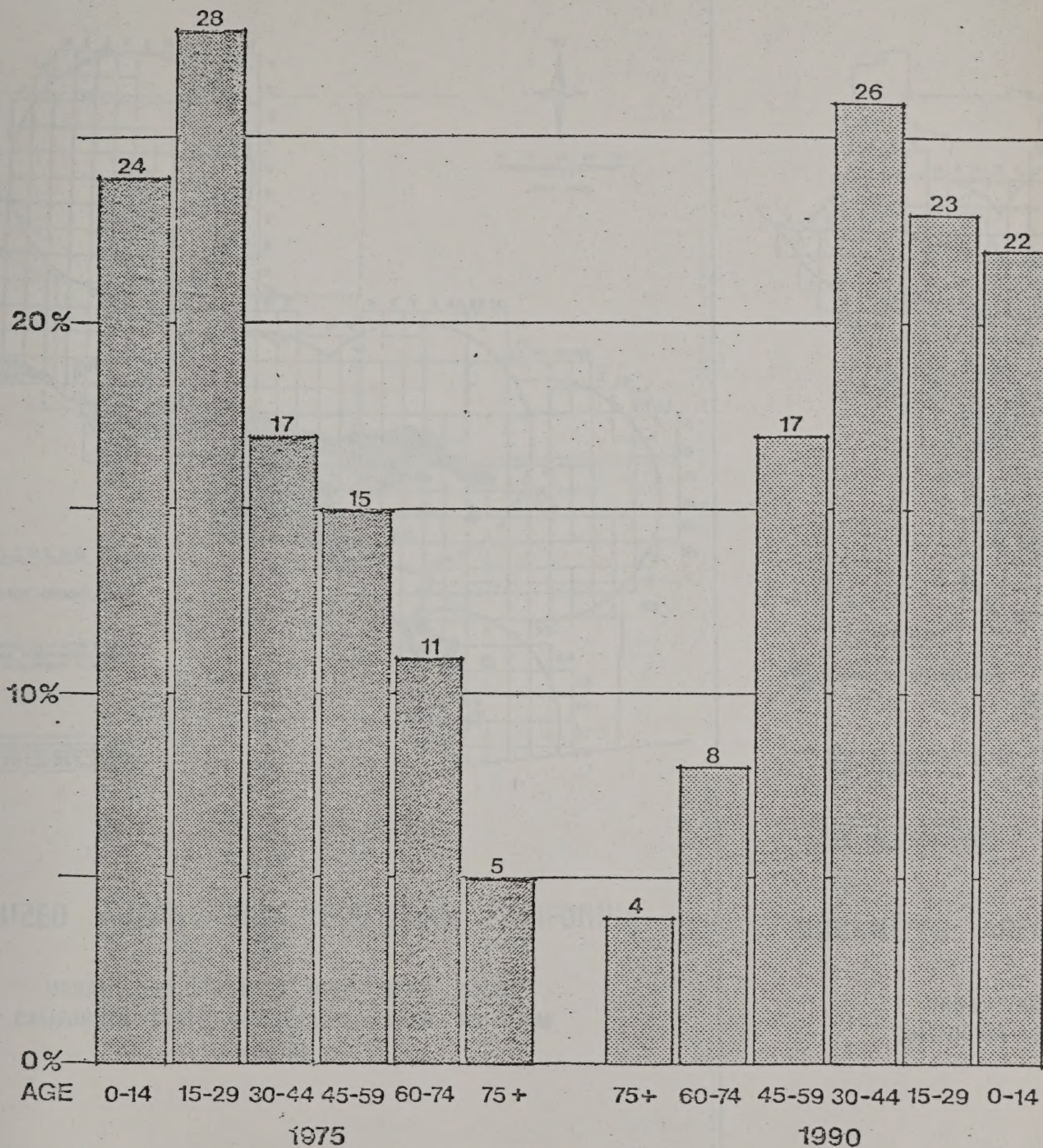
- ☐ System Update
- ☒ Long Term
- ☐ Remove Short or Long Term

17-00000

[illegible]

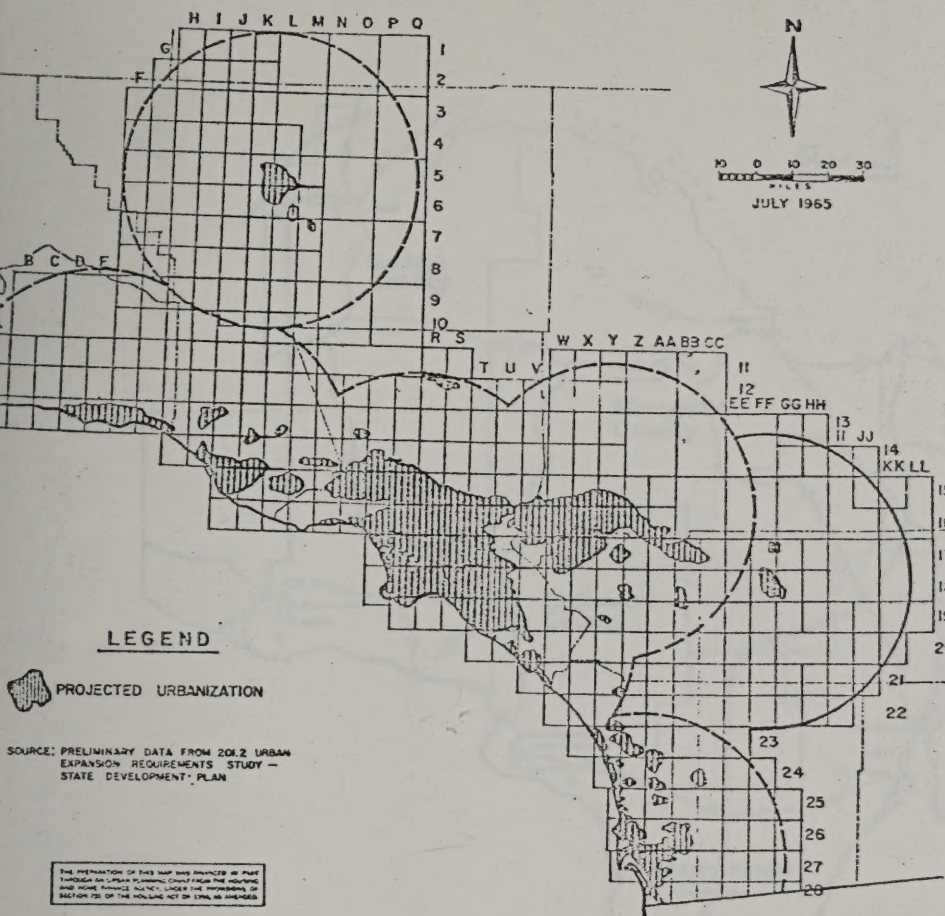
Figure 6-30. Urban-suburban summary matrix

30%



Source: POPULATION PROJECTIONS FOR THE COUNTIES OF MICHIGAN; 1975
State of Michigan Department of Management and Budget.

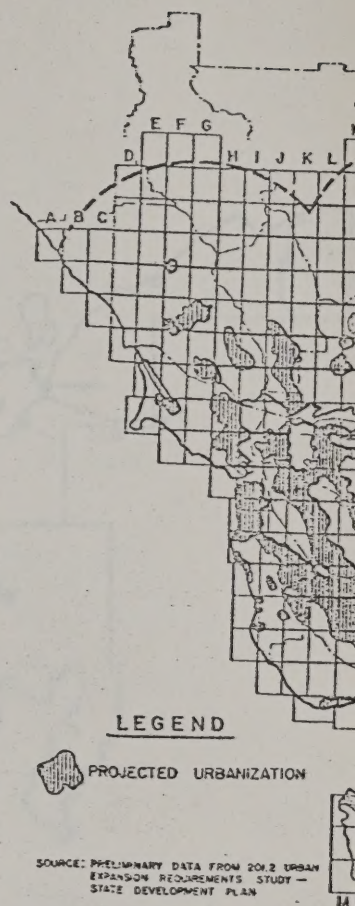
Figure 2. REGIONAL AGE DISTRIBUTION



URBANIZED AREAS - 1975 SOUTHERN CALIFORNIA

URBAN METROPOLITAN OPEN SPACE STUDY
CALIFORNIA STATE DEVELOPMENT PLAN PROGRAM

FIGURE 12

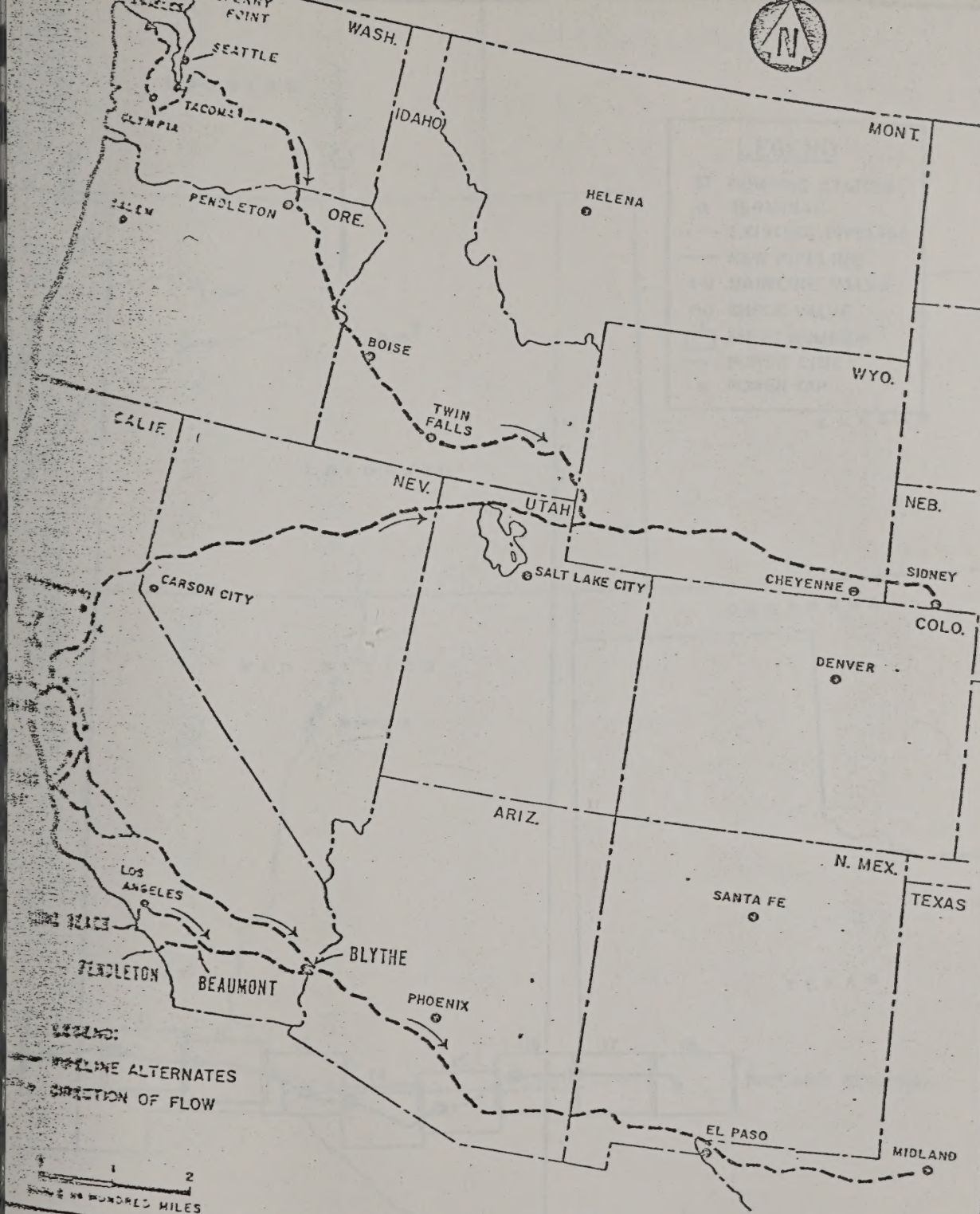


URBANIZED AREA

URBAN ME
CALIFORNIA ST



Figure 1. POPULATION CENTERS



WILLIAMS BROTHERS ENGINEERING COMPANY

A Resource Sciences company

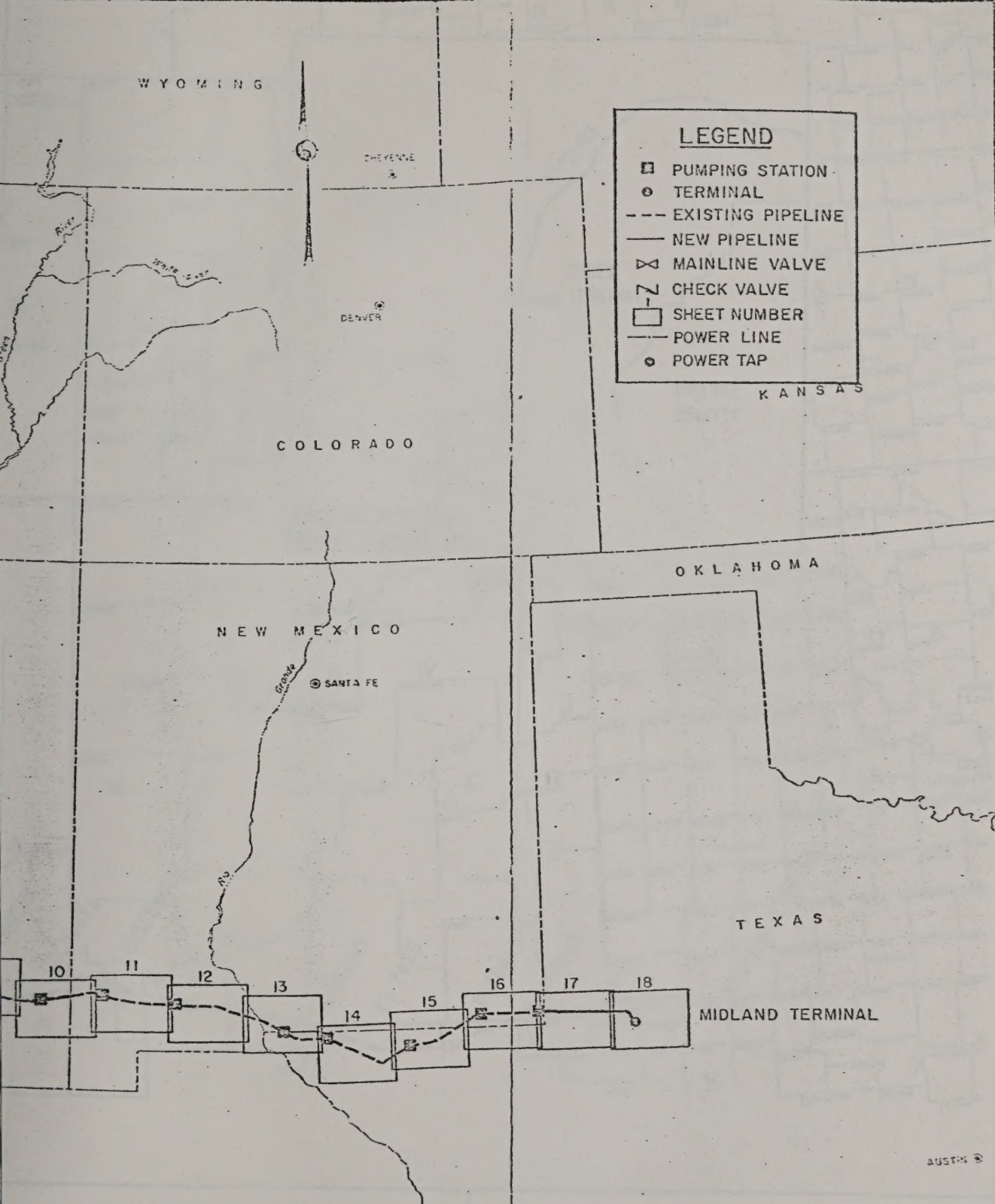
TULSA, OKLAHOMA

WEST COAST - MID-CONTINENT PIPELINE ALTERNATES

Date JANUARY 31, 1976

Approved W.N.T.

FIGURE 9E-2



WILLIAMS BROTHERS ENGINEERING COMPANY

A Resource Sciences company

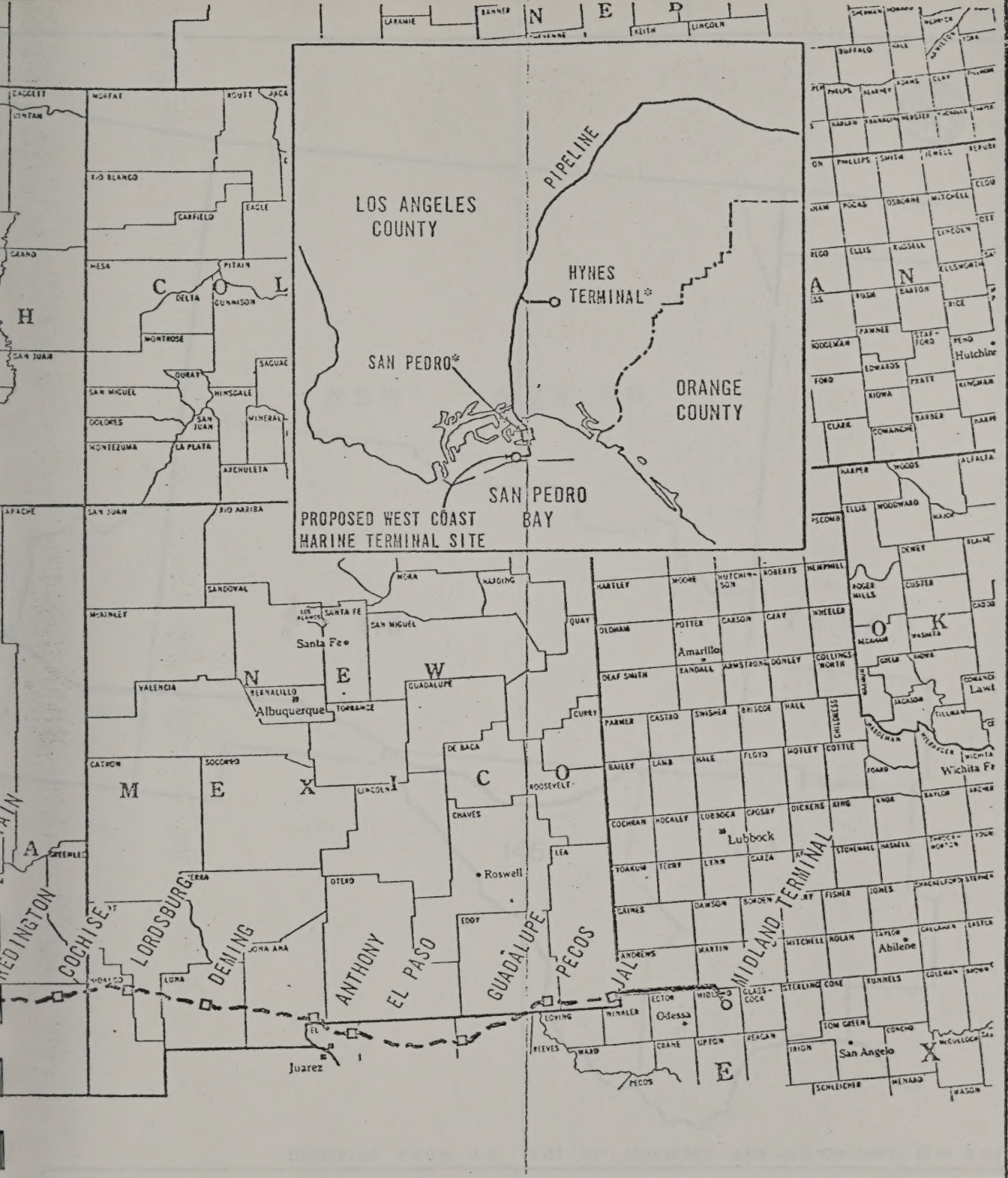
TULSA, OKLAHOMA

MAP INDEX
 PROPOSED WEST COAST - MID-CONTINENT PIPELINE
 SHEETS 1 THROUGH 18

Date JANUARY, 1976

Approved MAH/VPH

FIGURE IC.3-1



WILLIAMS BROTHERS ENGINEERING COMPANY

A Resource Sciences company

TULSA, OKLAHOMA

LOCATION OF FACILITIES
PROPOSED WEST COAST-MID-CONTINENT PIPELINE

Date JANUARY 1976

Approved MAH VPH MCA

FIGURE 1A.1-1



NEW MEXICO

145

TEXAS

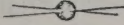
Midland

145

124

(MODIFIED FROM U.S. DEPT. OF COMMERCE AND AGRICULTURE, 1974 A.N.)

WILLIAMS BROTHERS ENGINEERING COMPANY


A Resource Sciences company

TULSA, OKLAHOMA

GEOGRAPHIC AREAS FOR OBERS PROJECTIONS

Date JANUARY 31, 1976

Approved G.H.M.

FIGURE 2B.-1



NEW MEXICO

TEXAS

(E)

(F)

(G)

(SOURCE: U.S. BUREAU OF THE CENSUS, 1973 b.)

WILLIAMS BROTHERS ENGINEERING COMPANY


A Resource Sciences company

TULSA, OKLAHOMA

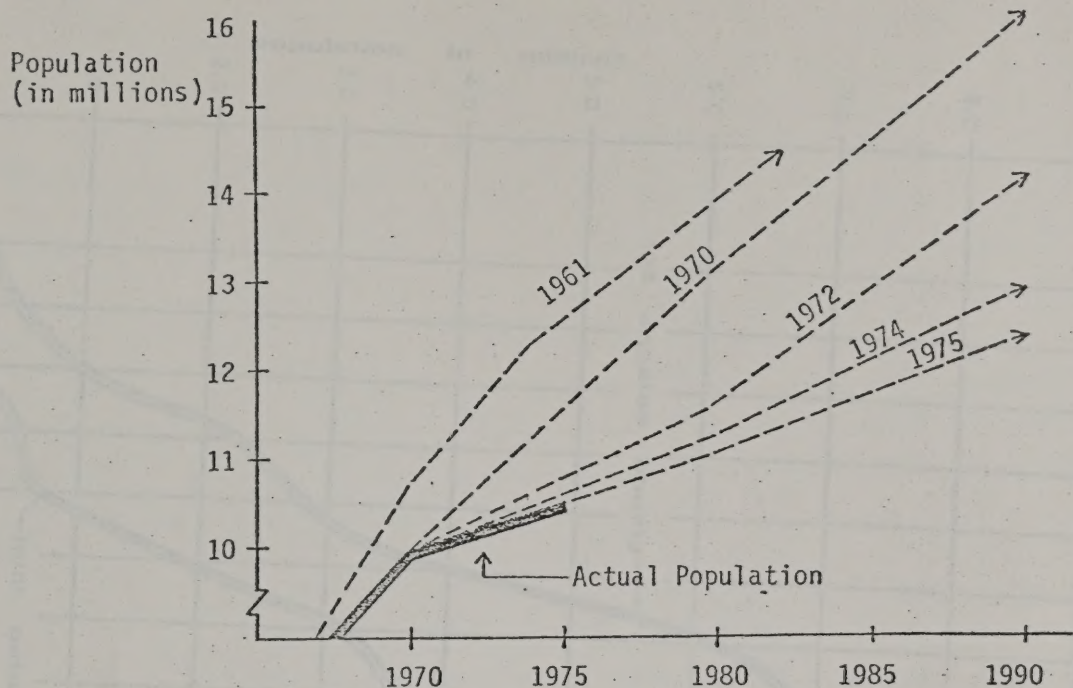
STANDARD METROPOLITAN
STATISTICAL AREAS

Date JANUARY 31, 1976

Approved G.H.M.

FIGURE 2A.13-1

FIGURE 1
COMPARISON OF POPULATION FORECASTS BY PUBLICATION YEAR



Sources: State Development Plan Program (1962)
SCAG draft documents and sequentially adopted forecasts

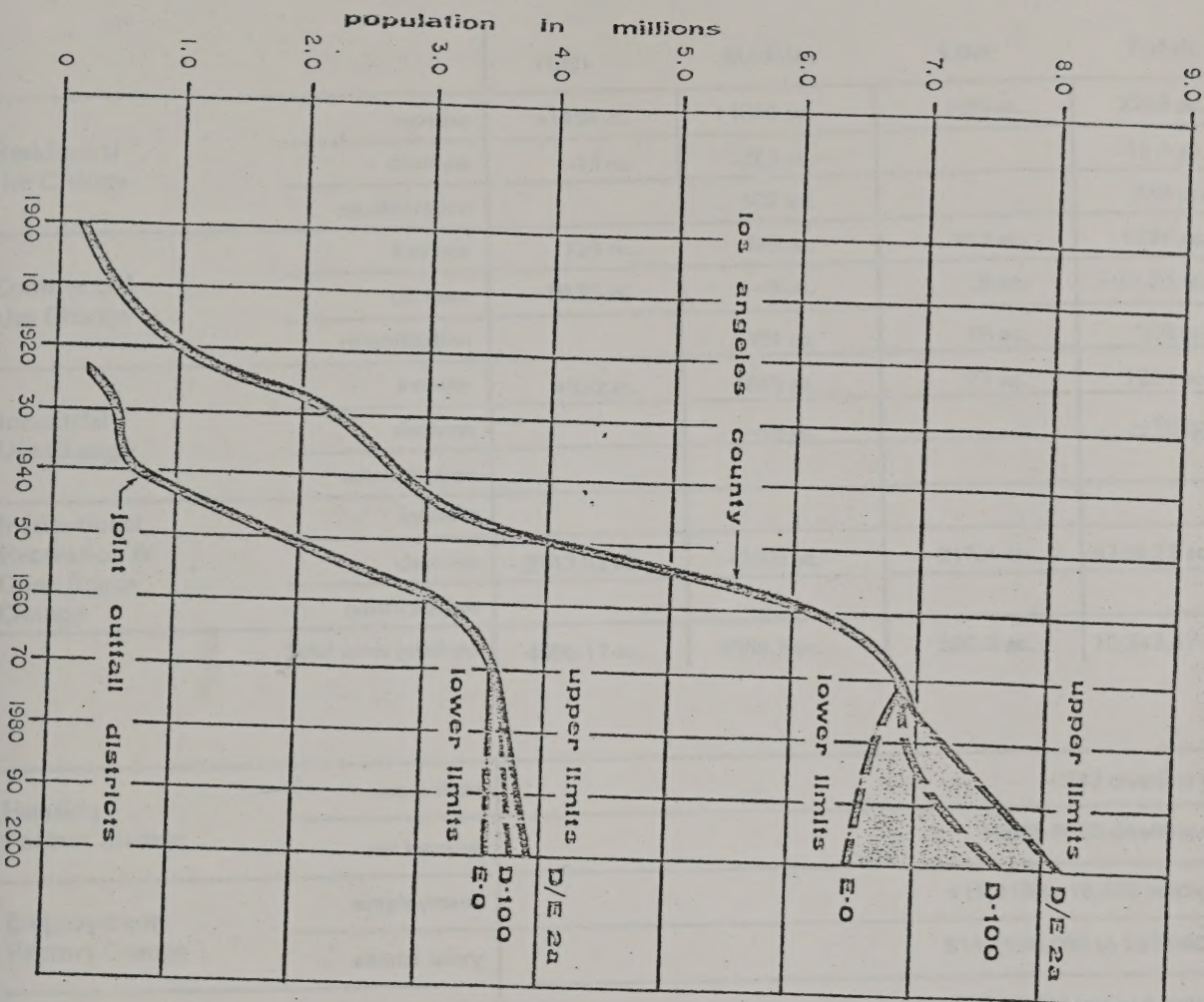
FIGURE 2
SCAG REGION ALTERNATIVE POPULATION FORECASTS

<u>FORECASTS</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
SCAG-76	11,086,200	12,255,000	13,295,000
D/E 2a (SCAG)	11,218,700	12,704,600	13,973,900
Feb Delphi	11,117,000	11,877,000	12,396,000
D-100	10,905,300	12,287,600	13,611,200
E-0 (DOF)	10,478,700	10,970,300	11,347,600
Bureau of Economic Analysis*	11,353,800	12,608,200	

*Includes SCAG Forecast of Imperial County: 90,000-1980; 102,000-1990.

Regional Population Trends and Alternative Projections

Series E-0, D-100, D/E 2a



during the two decades 1925-1945 with the formation of Districts 1,2,3,5, and 8 southwest of the City of Los Angeles. In the years 1945-65, after World War II, a second doubling occurred with the formation of Districts 15, 16, 17, 18, 19, 21, 22, 23, and 29 in the San Gabriel Valley and east Long Beach area. By 1970, however, the rate of population growth had declined due to lower birth rates and an out-migration to neighboring counties and northern California. There has been little or no population increase in the County as a whole, or the Joint Outfall Districts, since 1970. The present Los Angeles County population is about 7 million, of which about 3,650,000 reside in the Joint Outfall Districts.

Historical growth trends in the Joint Outfall Districts and alternative futures are shown in Figure 0-2. Future projections range from No Growth to a slow increase of 2-3% per decade. Regional population forecasts indicate a fairly narrow range of possible JOD populations in the year 2000--from 3,650,000 under the State Department of Finance Series E-0 projection to 3,900,000 under SCAG's Series D/E 2a forecast, a difference of about 5%.

Future growth in Los Angeles County and in the Districts is a critical issue for regional planning. Further growth is desirable only in conjunction with a regional plan to abate the severe air pollution problem existing at this time, as discussed in Chapter II and VII.

4. Joint Outfall System Characteristics

The modern Joint Outfall System has evolved into two treatment subsystems, coastal and inland:

SYSTEM WIDE SUMMARY

		High	Medium	Low	Totals
Residential Use Change	increase	+1194 ac.	+1018 ac.	+36 ac.	2248 ac.
	decrease	-16 ac.	-2.2 ac.		-18.4 ac.
	rehabilitation		538 ac.		538 ac.
Commercial Use Change	increase	723 ac.	498 ac.	103 ac.	1324 ac.
	decrease	-10.85 ac.	-9 ac.	.5 ac.	-20.35 ac.
	rehabilitation		194 ac.	15 ac.	209 ac.
Industrial Use Change	increase	+533 ac.	+676 ac.	21 ac.	1230 ac.
	decrease		-16 ac.		-16 ac.
	rehabilitation				
Institutional, Recreation & Open Space Change	increase				
	decrease	-2113.32 ac.	-2408 ac.	-217.4 ac.	-4738.72 ac.
	rehabilitation				
Total acres involved		4590.17 ac.	5359.2 ac.	392.9 ac.	10,342.47 ac.

Housing Factors Change	acquisition	-243 dwelling units
	net increase	+9585-9825 dwelling units
Employment Factors Change	employment	+15,115 to 16,425 employees
	annual salary	\$142,590,000 to 152,090,000
Tax Base Change	acquisition	-\$2,754,000 assessed valuation
	net increase	+\$51,776,000 assessed valuation

Table 9

BLYTHEEMPLOYMENT DISTRIBUTION BY INDUSTRY

(1972)

<u>Industry</u>	<u>Estimated Number Employed</u>	<u>Percent of Total Employment</u>
Construction	185	5%
Manufacturing	225	6
Transportation, Communications, Public Utilities	410	11
Wholesale/Retail Trade	895	24
Finance, Insurance, Real Estate	150	4
Services	815	22
Public Administration	225	6
Other (includes Agriculture)	<u>815</u>	<u>22</u>
Total	3,720	100%

Source: State of Arizona, Department of Economic Planning and Development;
Williams-Kuebelbeck and Associates, Inc.

Table 8
COMMUNITY SOCIO-ECONOMIC PROFILE

BLYTHE
(1960-2000)

	<u>1960</u>	<u>1970</u>	<u>1974</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
<u>Population</u>	6,023	9,545	11,850	17,960	30,150	39,100
Percent American Indian	2.0%	1.0%	0.8%	0.5%	0.3%	0.1%
<u>Income</u>						
Mean Household Income	\$6,800	\$8,750	\$9,625	\$10,839	N.A.	N.A.
<u>Housing</u>						
Occupied Dwelling Units	1,745	2,440	3,385	4,850	7,700	10,800

1974

Current and Future Housing Conditions

1. Dominant Structural Type - Single Family
2. Structural Condition - Good
3. Estimated Structural Value - \$18,000-\$32,000

Retail Base

Retail shopper and convenience goods located adjacent to I-10; strip commercial to serve travelers of I-10. The realignment of I-10 is forcing many retail facilities to move toward the new freeway (I-10).

Industrial Base

Light to heavy industry/growing tourism, water oriented recreation/related agricultural industry - supplies and processing.

Predominant Community Characteristics

Point of entry for transcontinental trucks, growing tourist industry along Colorado River and points north.

Source: U. S. Census; Riverside County Department of Development; Blythe Chamber of Commerce; Williams-Kuebelbeck and Associates, Inc.

WORK PREPARATION PLAN

AIR QUALITY

CHAPTER 1

INTRODUCTION

The overall objective of the air quality portion of this environmental impact statement is to evaluate magnitudes and locations of potential air pollution increments and resulting absolute air quality levels which are to be expected if the proposed SOHIO crude oil transportation system between the Port of Long Beach, California and Midland, Texas is constructed and operated in the 1980-2000 time period. The evaluation process is specifically oriented toward providing the necessary data, methodologies and results required by the National Environmental Protection Act (NEPA) and the BLM General Outline. We will summarize the basic steps of the analysis here, and then describe the preparation of the air quality inputs to the relevant sections of the EIS in the following sections which are numbered to conform with the BLM General Outline. The resources required and completion schedule for all the tasks and subtasks will be presented at the conclusion of this volume.

Data will be compiled in the categories of meteorology, air quality and pollutant emissions to characterize the existing environment in the study areas (Los Angeles Air Shed, Pipeline Route and Midland Terminal Area). These data will be analyzed and summarized in a report to the BLM on July 6. The air quality and meteorological data will be presented on 8-1/2 x 11 inch maps (see Figure 1) and in tabular form. Aggregated

pollutant emissions will be contained in tables, but distributions of traffic and pollutant emission rates in the Los Angeles area will be displayed in number maps such as the one shown in Figure 2.

The second phase of the work is concerned with identifying and quantifying all new sources of pollutant emissions and changes in emission rates from existing sources which occur as a result of the construction and operation of the project. It is particularly important that those areas of project operation having the potential for large pollutant emissions be well defined. This, of course, requires a precise definition of the proposed project and any emission control measures to be implemented as part of the basic project operation. (In the absence of documented technical justification for the effectiveness of proposed control techniques, it will be necessary for ERT to assume that emissions are uncontrolled, treating unsubstantiated control methods as possible mitigation measures.) The resulting compilation of air pollutant emissions will be summarized in a report on the causes of air pollution impact to be delivered to the BLM on July 13.

The evaluation of air quality impact is based on definition of selected meteorological conditions in the study areas. Models capable of translating pollutant emissions into air quality will be selected and calibrated against existing pollutant measurements. These models will then be exercised in three basic scenarios, to predict future ambient air quality in the absence of the project, with the project as proposed, and with certain mitigating measures added to the project. The results of the no-project calculations will define the expected baseline air quality against which the calculated impacts of the project may be compared.

The results of the model calculations with mitigation measures incorporated will define the unavoidable air quality impacts of the proposed action. All model calculations of future air quality in the study area will be interpreted and documented in a report to the BLM on August 23. Graphics for the Impact Evaluation Report will include maps of the Los Angeles area showing the paths traced by the selected air parcel trajectories, and indicating distributions of air pollutant concentrations (see Figure 3).

The contents of the interim reports on the Existing Environment, Impact Causes, and Impact Evaluation will be consolidated and minor revisions incorporated in a Final Report to be delivered to BLM on September 16.

Climate Region. BLM has reviewed the description of each region and found that it is essentially complete. It is understood that the BLM will provide a history of climate for this E.I.R.

The BLM has reviewed the description of each field and finding and found that it is essentially complete. This information will be included as part of the methodology section (3.0.1) before the final report.

2.1.5 Air Quality

2.1.5.1 Los Angeles Air Shed

The most significant air quality deterioration due to the proposed BLM pipeline project will occur in the Los Angeles air shed which encompasses most of Air Quality Control Region (AQCR) 14. Air quality data for the Los Angeles air shed will be analyzed to provide baseline information on

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

2.1 EXISTING ENVIRONMENT

2.1.1 Climate

The West Coast - Mid-Continent Pipeline Project E.I.S. divides the pipeline route into three climatic regions; the Pacific Coast Climatic Region, the Intermountain Plateau Climatic Region, and the Great Interior Climatic Region. ERT has reviewed the description of each region and feels that it is essentially complete. It is understood that the BLM will provide a summary of climate for this E.I.S.

ERT will augment the description of winds fields and mixing depths in the L.A. basin for the purpose of impact analysis. This information will be included as part of the methodology section (3.0.1) rather than the climate section.

2.1.6 Air Quality

2.1.6.1 Los Angeles Air Shed

The most significant air quality deterioration due to the proposed SOHIO pipeline project will occur in the Los Angeles air shed which encompasses most of Air Quality Control Region (AQCR) 24. Air quality data for the Los Angeles air shed will be examined to provide baseline information on

the existing environment. Following a review of available air quality and meteorological data for the Los Angeles area, ERT will select a base year for each pollutant of interest; ozone (as the primary constituent of oxidant), SO_2 and total suspended particulates (TSP). The main criteria for choosing a base year are availability of simultaneous air quality and meteorological measurements near critical source and receptor sites, with relatively high ambient pollutant concentrations. Oxidant, SO_2 and TSP measurements are routinely recorded at an extensive network of continuous air monitoring stations in the Los Angeles area. Data from these stations are archived and available on magnetic tape from the California Air Resources Board (CARB) and the Southern California Air Pollution Control District (SCAPCD). In addition the CARB data are published in quarterly summary reports. ERT has on magnetic tape in its data bank all of the ARB aerometric data for the South Coast Air Basin through 1974 and aerometric data taken at Los Angeles APCD stations from 1955 through 1972. Hourly averaged wind speed and direction data are also available in punched card form from about 15 meteorological stations operated by the APCD. ERT currently has wind data in this form for all the stations on three high oxidant days in 1969, selected by the criteria mentioned above for use in earlier air quality impact analyses. In view of the time schedule imposed on this study, one of these days will probably be selected as the baseline for the oxidant analysis, eliminating the need for acquisition of new data and the time consuming search for simultaneous availability of ozone measurements, wind data and morning readings of nonmethane hydrocarbons and NO_x .

The calendar year 1974 has been selected as the baseline year for the non-reactive criteria pollutants sulfur dioxide (SO_2) and total suspended particulates (TSP) because more information is available for this year than for previous years and later data are not completely processed.

Baseline SO_2 and TSP levels for 1974 will be obtained from the monitoring network maintained by the California Air Resources Board (CARB) and the Southern California Air Pollution Control District. SO_2 and TSP data for the Los Angeles air shed will be plotted on an area map to assist in locating high concentration areas near the port and terminal facilities and the pipeline route. Baseline data will be discussed with emissions data obtained from the same State Agencies.

The Existing Environment report will summarize the air quality and wind data for the selected base years. Frequency distributions of pollutant readings will be displayed for critical locations, but extensive data presentations will be placed in a technical appendix or incorporated by reference if possible.

Although pollutant source emissions are not actually part of the existing air quality, it is nevertheless necessary for modeling purposes to characterize the spatial and temporal distribution of pollutant emissions which produce that air quality in the absence of the proposed project. As a part of earlier air quality impact analyses, Mr. Nordsieck of the ERT staff has constructed a model which generates such emission distributions for the South Coast Air Basin (1). This model accepts aggregated stationary source emissions in the forms generally available from the

SCAPCD, distributing them by a land use allocation technique. Vehicular emissions are characterized by gram-per-mile emission factors and distributions of vehicle miles traveled (VMT) on a 2 mile x 2 mile grid. Functions characterizing the growth of different pollutant source types with time are included in the model, being based on information obtained from the CARB, the SCAPCD and the California Department of Transportation (CALTRANS). Vehicle emission factors will be calculated using the methods described in the recently released Supplement 5 to EPA's Compilation of Air Pollutant Emission Factors (2).

The emissions model described above will be employed to provide reactive HC and NO_x emissions from sources in the study area which are not related to the project. Refinery emissions, included in the model, can be adjusted to correspond to the desired oil production level for each scenario. The HC and NO_x emissions distributions generated for the base year will be summarized in the Existing Environment Report.

2.1.6.2 Pipeline Route

Existing air quality along the pipeline route will be described using monitored air quality data from outside of the Los Angeles area to the eastern terminus at Midland, Texas. The proposed facilities are expected to have small local impacts and not to significantly contribute to air pollutant levels outside of the following Air Quality Control Regions (AQCR's):

1. AQCR 33 Southeast Desert.
2. AQCR 13 Clark - Mohave.
3. AQCR 15 Phoenix - Tucson.
4. AQCR 12 Arizona - New Mexico, Southern Border.
5. AQCR 153 El Paso - Las Cruces - Alamogordo.
6. AQCR 155 Pecos - Permian Basin
7. AQCR 218 Midland - Odessa - San Angelo.

Limited air quality data are available for locations along the pipeline route because of the sparse population in most areas. SO_2 and TSP data along the route are expected to be most complete but data on hydrocarbons, ozone, and nitrogen oxides will be presented where available. A qualitative description of air quality in data sparse regions will be attempted using published data in representative rural areas similar to the study area. The representativeness of all data will be discussed so that data from urban or site specific monitors will not be generally applied to low concentration areas.

Data for air quality along the pipeline route will be obtained from the National Air Surveillance Network, the California Air Resources Board, The Arizona Department of Health Services, The New Mexico Environmental Improvement Agency and the Texas Air Control Board. Attention will be given to data from air quality maintenance areas for specific pollutants.

2.1.6.3 Midland and Vicinity

Data describing air quality in the vicinity of the Midland Terminal will be examined in a manner similar to those along the pipeline route. Particular attention will be given to TSP and hydrocarbons which will be the major pollutants due to construction and the eastern terminal operation. This task will also determine if the Midland-Odessa-San Angelo AQCR is an air quality maintenance area for any pollutant.

The major data sources are expected to be the Texas Air Control Board and the National Air Surveillance Network (EPA Region VI).

2.1.6.4 Air Quality Standards

Air quality standards provide a base from which pollutant levels may be evaluated. To assess the degree of impact of various portions of the pipeline project on air quality, several standards and regulations must be addressed. The first task in this analysis will be to list and compare National Ambient Air Quality Standards (NAAQS) with state standards of California, Arizona, New Mexico, and Texas. In most cases, state ambient air quality standards will be more stringent than the NAAQS for selected pollutants.

In addition to the ambient standards, further regulations on the prevention of significant air quality degradation promulgated by the EPA will be listed. Implications of these standards will be discussed in describing air quality in later sections.

2.2 FUTURE ENVIRONMENT WITHOUT THE PROJECT

2.2.6 Air Quality

2.2.6.1 Los Angeles Air Shed

Projection of future baseline air quality (O_3 , SO_2 and TSP) requires exercising the selected air quality models with projections of future year baseline pollutant emissions. In the case of oxidant prediction, this will require use of both the emissions model and the photochemical/diffusion model. For this reason it will be necessary to delay presentation of future (1980-2000) baseline air quality until the Impact Evaluation Report. These calculations will comprise the scenario usually called the "no-build" case. Projections of future year emissions inventories will include the expected effects of the California State Implementation Plan (SIP), New Source Performance Standards (NSPS), Air Quality Maintenance Plan (AQMP), and APCD emission controls. The HC and NO_x emissions distributions generated for future study years (1980 and 2000) will be summarized in the Existing Environment Report.

All states are required to develop air quality maintenance plans (AQMPs) in accordance with Section 110 of the Clean Air Act, as amended in 1970. AQMPs apply to Air Quality Maintenance Areas (AQMPAs) established by the state and approved by the EPA. AQMPAs are specified by pollutants which may be in violation of the national air quality standard in the next 10 years.

In order to provide guidance to the States on designating AQMPs the EPA has issued a thirteen (13) volume text entitled "Guidelines for Air

Quality Maintenance Planning and Analysis". Briefly, the process for developing a maintenance plan involves the following tasks.

1. projecting emissions to the future.
2. spatially allocating emissions.
3. estimating air quality resulting from projected emissions.
4. developing control strategies where needed.
5. adopting regulations to enforce control strategies.

The maintenance plan for Los Angeles calls for use of 1974 baseline air quality data and 1973 emissions data to project future air quality. Air quality changes are assumed to be linearly related to population projections as published by the California Department of Finance. In addition to population data, earnings projections and capital growth are also used. The ERT emissions model uses these and similar methodologies for projecting future air quality in Los Angeles. The effects of future control strategies which may be applied will be noted.

2.2.6.2 Pipeline Route

ERT will review the progress of Air Quality Maintenance Plan (AQMP) development for each state through which the pipeline passes. Air quality problem areas which have been designated Air Quality Maintenance Areas (AQMAS) will be noted. It is expected that the future air quality along the pipeline route will remain largely unchanged due to the proposed action.

2.2.6.3 Midland and Vicinity

Future changes in air quality in the environs of the Midland Terminal will be assessed using growth data based on population changes and data available on controls associated with any existing Air Quality Maintenance Plans after construction. The pipeline terminal is not expected to have a significant effect on future air quality.

2.2.6.4 Air Quality Standards

There do not appear to be any imminent changes in existing air quality standards. However, there has been much criticism of the ambient air quality standards for ozone and SO₂. The Texas Air Control Board has been one of the strongest non-industry critics of the 0.08 ppm one-hour average Federal oxidant standard. ERT will monitor these discussions and attempt to assess the likelihood of changes in the oxidant, SO₂ or TSP standards during the lifetime of the project. Standards for additional hazardous pollutants may be promulgated but the impact is not expected to effect the proposed project.

The EPA has established regulations concerning significant deterioration of air quality. Congress is presently considering amendments to the Clean Air Act which would change relative deterioration increments but would not change the intent of the regulations. The proposed House and Senate versions of the amendments will be discussed.

CHAPTER 3

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.0.1 Methodology of Impact Analysis

3.0.1. Air Quality

3.0.1. .1 Oxidant

The evaluation of air quality impact will be divided into three regions of the study area: (1) Los Angeles Basin, (2) the areas along the pipeline route, and (3) the Midland terminal in Texas. Reflecting the severity of the baseline air quality problem and the availability of both ambient and emissions data, ERT will carry out model studies to determine air quality for only the first of these regions. The second and third regions will be treated by tabulating emissions comparisons for the various scenarios and for the mitigation measure effects that will be proposed. However, in the discussion of the pipeline and Midland terminal regions, comparisons of air pollution potential will be made using standard reference material on mixing heights and wind speeds throughout the contiguous United States (3). Each region will be characterized by its climatology, atmospheric stability, and wind regimes.

In the Los Angeles Basin region, stability, wind speed, and wind direction will be quantified using meteorological data from the airports, and from SCAPCD wind stations. Trajectory analysis will be employed to trace

typical paths of pollutants from the facilities in question. Analysis of the meteorological conditions will yield the basic input data for advection and dispersion of pollutants to be used in the air quality models. Typical regimes include the land breeze/sea breeze reversal, a subsidence inversion capping marine layer flows, multi-day buildup of pollutants in the inversion layer from upslope chimney effects, and recirculatory flow in the lee region of the coastal mountain ranges in the presence of Santa Ana wind conditions.

The photochemical oxidant impact will be predicted by employing the ARTSIM model (the successor to DIFKIN, developed for the U.S. EPA) which computes the ground concentrations of hydrocarbon, oxides of nitrogen, carbon monoxide, and photochemical oxidant along air trajectories computed from ground station wind velocity data. Source oriented trajectories for critical conditions will be established as the basis of operation of this model. Sufficient variation in trajectories will be sought in order to prepare maps depicting present and projected pollutant concentration levels on the ground. Initial conditions and chemical reactivity assignments will be chosen for the baseline calibration runs to provide a valid point of departure for the impact evaluation.

An existing ERT emissions model for the South Coast Air Basin (1) will be used to generate temporal and geographical distributions of HC and NO_x emissions from stationary and mobile sources necessary as input to ARTSIM. This model incorporates functions which characterize the growth of different pollutant source types with time, and hence is capable of accounting for the cumulative effects of other new emissions sources which may accompany population or economic growth. Adjustments can be made in the inventory

for the evaluation of mitigation measures. Similar modifications to the existing source inventory and its forecast values may occur in the case of intensified throughput of crude oil in the Los Angeles refinery system.

The procedure for conducting an oxidant impact analysis with a trajectory model such as ARTSIM starts with selection of a one or more base days in a base year. The selection criteria for base days are availability of simultaneous air quality (morning HC and NO_x) measurements near critical source sites, wind data sufficient to define air parcel trajectories traversing the sources, and ozone measurements near the afternoon locations of the trajectories, preferably on days which yielded elevated ozone levels. The aim of the trajectory analysis which accompanies this selection process is to identify trajectories which may carry pollutants from project related source sites to sensitive receptor areas or other populated areas. Geographical and temporal distributions of pollutants emissions prepared for the study are for the base year and for future study years with and without the project, and with and without the effects of mitigating measures. The air quality model is calibrated by adjusting hydrocarbon reactivities and initial conditions until the model reproduces measured peak ozone levels on a base day (without project related emissions). Then the model is exercised using the same meteorological conditions, but emissions inputs appropriate for the desired scenarios. Initial pollutant concentrations for future year scenarios are reduced toward their global background levels in proportion to reductions in aggregated primary emissions. These final model runs will yield the oxidant impacts of the proposed project with and without mitigation measures in the years 1980 and 2000 according to the input emissions scenario.

3.0.1. .2 SO₂

Sulfur dioxide emissions due to the proposed project are expected to represent a very small increase over present emissions levels in the Los Angeles air basin. Two sources will be considered; emissions due to tanker fuel use and emissions due to refining the crude oil in the Los Angeles basin.

Emissions from the tanker boilers will be estimated using the percent sulfur content of the fuel oil and the expected fuel use. The South Coast APCD will be contacted to see if there are regulations on emissions from ship power generating facilities.

Approximately 200,000 barrels of oil per day are expected to pass through Los Angeles refineries in El Segundo, Wilmington, Santa Fe Springs or Carson. Tail gas emissions from the refineries are regulated by California law. Therefore, emissions from the tail gas are not expected to vary significantly in proportion to the percent of sulfur in the oil refined. The major source of SO₂ emissions will come from the cat crackers and cokers. ERT will estimate the magnitude of these emissions.

A well mixed box model will be used to predict the impact of SO₂. It is based on the following assumptions.

1. The Los Angeles basin is the critical exposure region containing the principal emitters.

2. The worst case annual inversion height in the morning will provide an upper limit for ground level concentration.
3. The atmospheric turnover time for pollutants in this area is approximately twenty-four hours. This assumption has proved to be a reasonable approximation for such calculations in many areas, including Los Angeles.
4. The annual averaged concentrations could be scaled to suitable short-term averages for worst case conditions by factors derived statistically by Larsen (1975):**

3.0.1. .3 TSP

Emissions of TSP due to the proposed action will be significant only during the construction phase. Emissions will be estimated by applying the methodology outlined in the PEDCo report prepared for the EPA entitled "Investigation of Fugitive Dust - Sources emissions and Control". Corrections will be applied for variations in climatic conditions along each major segment of the pipeline. TSP emissions will be modeled for the purpose of impact analysis using the methodology described for SO₂.

**For "scaling" purposes, Larsen (1975) recommends that an eight-hour standard should be 9.8 times the annual median; a three-hour standard should be 13 times the annual median, and a one-hour standard should be 18 times the annual median.

3.1 EXISTING ENVIRONMENT (direct and indirect impacts of construction and operation, year 1980)

3.1.6 Air Quality

3.1.6.1 Los Angeles Air Shed

This section of the EIS will give a general description of the aspects of the proposed project relating to air quality in 1980, including any necessary assumptions concerning proposed or unspecified emission control measures. Where conflicts arise between pollutant emission claims by the applicant and ERT emission calculations, resolutions will be achieved only with the approval of the BLM air quality task monitor.

3.1.6.1.1 Oxidant

A detailed description of the direct and indirect sources of HC and NO_x emissions resulting from construction and operation of the project will be prepared for this section of the EIS. The associated oxidant impacts predicted by the ARTSIM simulation will be presented, and changes in air quality relative to the no-build scenario will be discussed in light of the NAAQS for oxidant.

3.1.6.1.2 SO₂

The number of violations of the SO₂ standards within the Los Angeles Air Basin has been published by the CARB. It appears that annual standards are more frequently violated than short term standards. Average

SO₂ levels in the basin are about one-half of the annual and 24-hour standards. The incremental change in SO₂ emissions due to the proposed actions is not expected to change the current situation substantially. ERT will quantify these effects using the methodology described in Section 3.0.1.2.

3.1.6.1.3 TSP

Total suspended particulate levels presently exceed state and federal standards in the Los Angeles Air Shed. The construction phase of the proposed project will temporarily add to this particulate burden.

The impact of construction will be quantified and the results compared to present conditions. Control technologies anticipated by State Implementation Planning will be noted.

3.1.6.2 Pipeline Route

Note that 1980 air quality outside the Los Angeles area is to be characterized only by the changes in pollutant emissions which result from the construction and operation of the project.

3.1.6.2.1 Oxidant

Precursor emissions of HC and NO_x from construction and project operations along the pipeline route will be presented in this section. Only minor emissions of HC and NO_x from construction equipment are expected during construction. The only emissions of HC and NO_x during operation will be from service and maintenance vehicles, and from occasional operation of the pumping station surge tanks which will normally be empty.

3.1.6.2.2 SO₂

No significant SO₂ emissions are expected during construction or operation. Vehicular emissions of SO₂ are very small.

3.1.6.2.3 TSP

TSP levels along the proposed pipeline route are expected to be high during construction of the pipeline and support facilities because of the arid conditions along the route. The emissions during operation of the pipeline system will be from routine maintenance along the route. The emissions at the operating stage will be very small because of the nearness of the route to existing paved access roads. In either phase, additional TSP related to the project will be insignificant compared to the high desert background levels which will remain unchanged.

3.1.6.3 Midland and Vicinity

Note that 1980 air quality in the Midland area is to be characterized only by the changes in pollutant emissions which result from the construction and operation of the project.

3.1.6.3.1 Oxidant

Minor additional emissions of HC and NO_x from construction equipment are expected during construction. Estimates of HC emissions from the new petroleum storage tanks at the Midland Terminal will be presented. There will also be minor additional amounts of HC and NO_x emissions from service and maintenance vehicles and from the secondary traffic generated by the operation of the project.

3.1.6.3.2 SO₂

No significant SO₂ emissions are expected during construction or operation. Vehicular emissions of SO₂ are very small.

3.1.6.3.3 TSP

Construction and operation of the Midland Terminal are not expected to contribute significantly to the existing TSP levels. The magnitude of TSP emissions during construction will be evaluated and discussed.

3.2 CUMULATIVE IMPACTS (environment at year 2000)

3.2.6 Air Quality

3.2.6.1 Los Angeles Air Shed

This section of the EIS will describe any aspects of the project relating to air quality which may have changed since 1980 (e.g., refinery through-

put of high sulfur crude), and the resulting changes in pollutants emissions. The associated air quality impacts within the Los Angeles Air Shed in the year 2000 will then be presented.

3.2.6.1.1 Oxidant

Any changes expected in HC and/or NO_x emissions from project related sources between 1980 and 2000 will be described here. The results of the ARTSIM predictions of associated oxidant levels will be presented, and changes in air quality relative to the baseline (no-build) case and the NAAQS will be discussed.

3.2.6.1.2 SO₂

SO₂ concentrations in the Los Angeles Air Basin will be evaluated by the methods described in Section 3.0.1.2. Effects of changes in State and Federal regulations and refinery allocation alternatives will be used to determine incremental changes in air quality.

3.2.6.1.3 TSP

Evaluation of state implementation plans will be required to evaluate expected TSP levels in the period between 1980 and 2000. TSP emissions associated with the project are expected to be small with no change from 1980 to 2000.

3.2.6.2 Pipeline Route

Note that future air quality outside the Los Angeles area is to be characterized only by the changes in pollutant emissions which result from the operation of the project.

3.2.6.2.1 Oxidant

The only sources of HC and NO_x emissions during project operation will be from service and maintenance vehicles, and from occasional operation of the pumping station surge tanks which will normally be empty. Estimate of these emission rates will be presented.

3.2.6.2.2 SO₂

No significant SO₂ emissions expected from project operation. SO₂ emissions from service vehicles will be very small.

3.2.6.2.3 TSP

TSP emissions associated with the project during the 1980 to 2000 period will be small since they will only result from maintenance vehicles along the pipeline route.

3.2.6.3 Midland and Vicinity

Note that future air quality in the Midland area is to be characterized only by the changes in pollutant emissions which result from the operation of the project.

3.2.6.3.1 Oxidant

Estimates of HC emissions from the petroleum storage tanks (not 20 years old) at the Midland Terminal will be presented, as well as estimates of the minor additional amounts of HC and NO_x emissions from service and maintenance vehicles and from secondary traffic induced by the project.

3.2.6.3.2 SO₂

No significant emissions of SO₂ are expected during project operation. Vehicular emissions of SO₂ are very small.

3.2.6.3.3 TSP

Vehicular traffic at the terminal will be the only TSP source and will result in negligible changes in TSP levels.

CHAPTER 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

4.0 INTRODUCTION

4.0.1 Methodology for Determining Mitigating Measures

4.0.1. Air Quality

Formulation of mitigation measures for all operations (port facilities, storage facilities, pipeline, and terminal distribution storage) will be based on "best technology" methods of emission control. In the area of petroleum storage tanks, the latest technology appears to be a double seal system said to substantially reduce HC vapor losses from floating roof tanks. In some cases hypothetical control schemes must be assumed where technology has not been clearly developed. An example of this situation may arise in the case of tank ship unloading at the marine terminals. Although there is no documentation of any proven vapor control scheme for reducing HC emissions during the unloading process, one interesting mitigation scenario would be to evaluate the air quality impacts which result if the tankship unloading process is brought into conformance with all Federal, State, and locally mandated emission limits for new sources. In each study area and for each pollutant, one mitigation scenario will be formulated which represents either the minimum emission rate necessary to satisfy all applicable regulations, or the minimum rate achievable with known technology, whichever is lower.

4.1 MEASURES REQUIRED BY FEDERAL AGENCIES

All applicable emission rate limits and control techniques required by Federal Agencies will be described or referenced. Wherever such regulations require the minimum emission rates as compared to other statutory limits or control techniques, those rates will form a part of the mitigation scenario.

4.2 MEASURES REQUIRED BY STATES AND OTHER ENTITIES

All applicable emission rate limits and control techniques required by State Agencies and other cognizant regulatory entities will be described or referenced. Wherever such regulations require the minimum emission rates as compared to other statutory limits or control techniques, those emission rates will form a part of the mitigation scenario.

CHAPTER 5

ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD
THE PROPOSAL BE IMPLEMENTED

5.1 NATURAL ENVIRONMENT

5.1.6 Air Quality

5.1.6.1 Los Angeles Air Shed

5.1.6.1.1 Oxidant

This section of the EIS will describe the HC and NO_x emissions to be expected from project related sources under the mitigation scenario described in Section 4.0.1., and present the associated oxidant impacts in 1980 and 2000 as predicted by the ARTSIM simulation. These results will then be compared to the oxidant predictions under the no-build scenario to indicate what portion of the oxidant impact is unavoidable.

5.1.6.1.2 SO₂

The impacts of the oil refining, construction, and transportation in the Los Angeles Air Basin associated with controlled emissions will be discussed. A comparison of the build and no-build cases will provide information on unavoidable impacts.

5.1.6.1.3 TSP

Adverse TSP impacts associated with the project in the Los Angeles Air Basin will occur in the construction phase. Impacts under mitigation conditions will be assessed if measures are required.

5.1.6.2 Pipeline Route

It is unlikely that mitigation measures will be required. However, if they are indicated, pollutant emission from the project under the mitigation scenario will be presented here.

5.1.6.2.1 Oxidant

HC and NO_x emissions will be presented as reduced by the effects of the mitigation scenario.

5.1.6.2.2 SO₂

Emissions of SO₂ along the pipeline route are expected to be minor during construction and operation. Mitigation measures for these transportation related emissions will not have a significant effect on reducing expected SO₂ levels.

5.1.6.2.3 TSP

The effects of available mitigation measures will be assessed. It appears unlikely that such measures would significantly reduce TSP emissions.

5.1.6.3 Midland and Vicinity

If indicated, pollutant emissions from project related sources as reduced by the selected mitigation measures will be presented in this section.

5.1.6.3.1 Oxidant

HC and NO_x emissions will be presented as reduced by the effects of the mitigation scenario.

5.1.6.3.2 SO₂

Mitigation measures as applicable will be discussed in terms of SO₂ emissions but little improvement in air quality associated with these measures is expected.

5.1.6.3.3 TSP

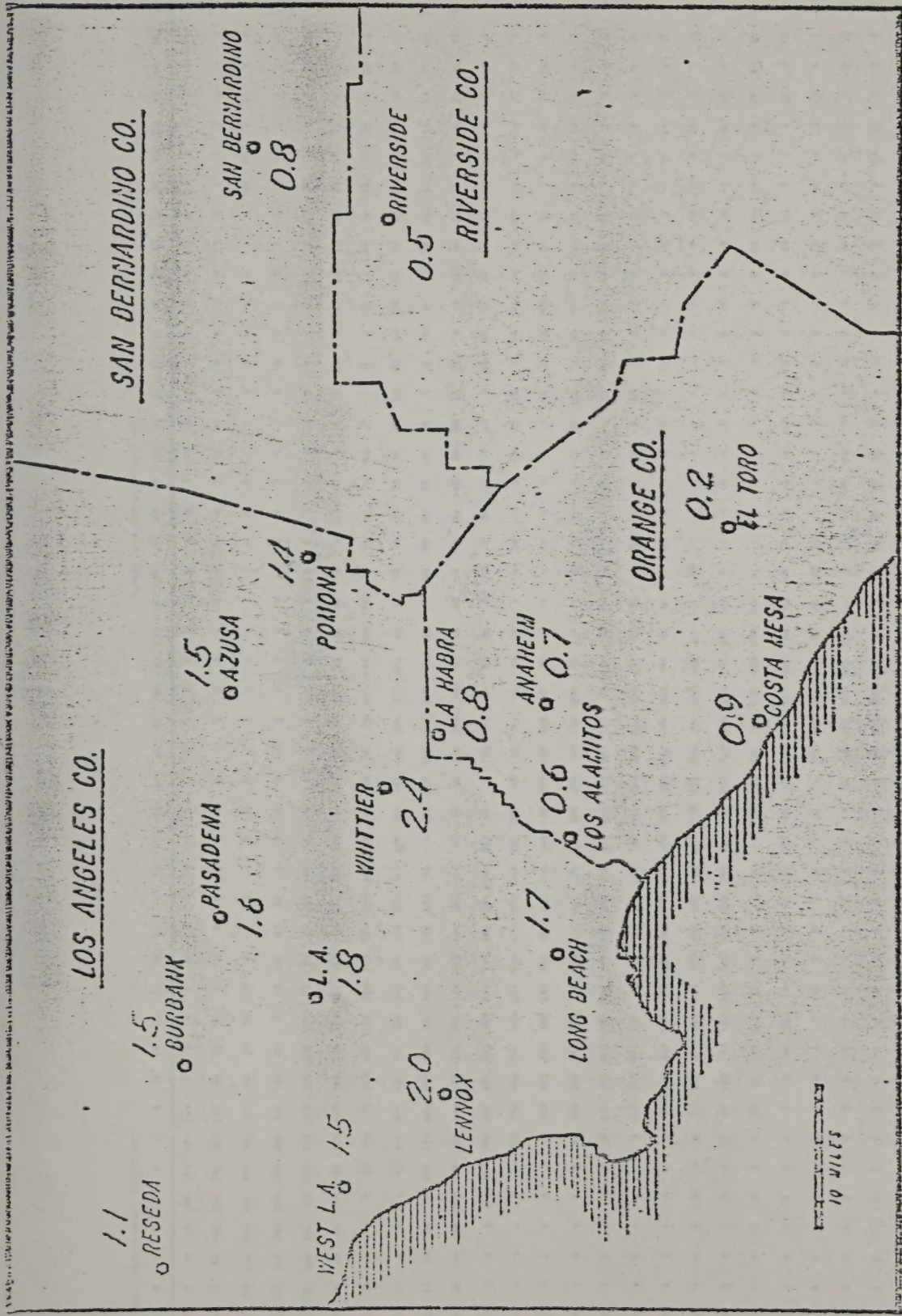
TSP emissions will be discussed with consideration of possible mitigation measures.

REFERENCES

1. R. A. Nordsieck, Pollutant Emissions Estimates and Projections for the South Coast Air Basin, General Research Corporation, RM-1905A, August 1974.
2. C. C. Masser and D. S. Kircher, Preliminary Edition of Supplement Five to Compilation of Air Pollutant Emission Factors, U.S. Environmental Protection Agency, AP-42, April 16, 1975.
3. G. C. Holzworth, Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States, American Meteorological Society Symposium on Atmospheric Diffusion and Air Pollution, Santa Barbara, California, September 9-13, 1974.

RESOURCE REQUIREMENTS FOR AIR QUALITY TASKS AND DELIVERABLES

<u>Task</u>	<u>Labör (hours)</u>
2.1.6	100
2.2.6	230
3.0.1	75
3.1.6	275
3.2.6	270
4.0.1	15
4.1	35
4.2	35
5.1.6	145
	<u>1180</u>
<u>Item</u>	
Preparation Plan	170
Description of Env.	300
Impact Causes	320
Impact Evaluation	560
Final Report	160
	<u>1510</u>



SULFUR DIOXIDE ANNUAL AVERAGE CONCENTRATIONS, ppb
SOUTH COAST BASIN 1974

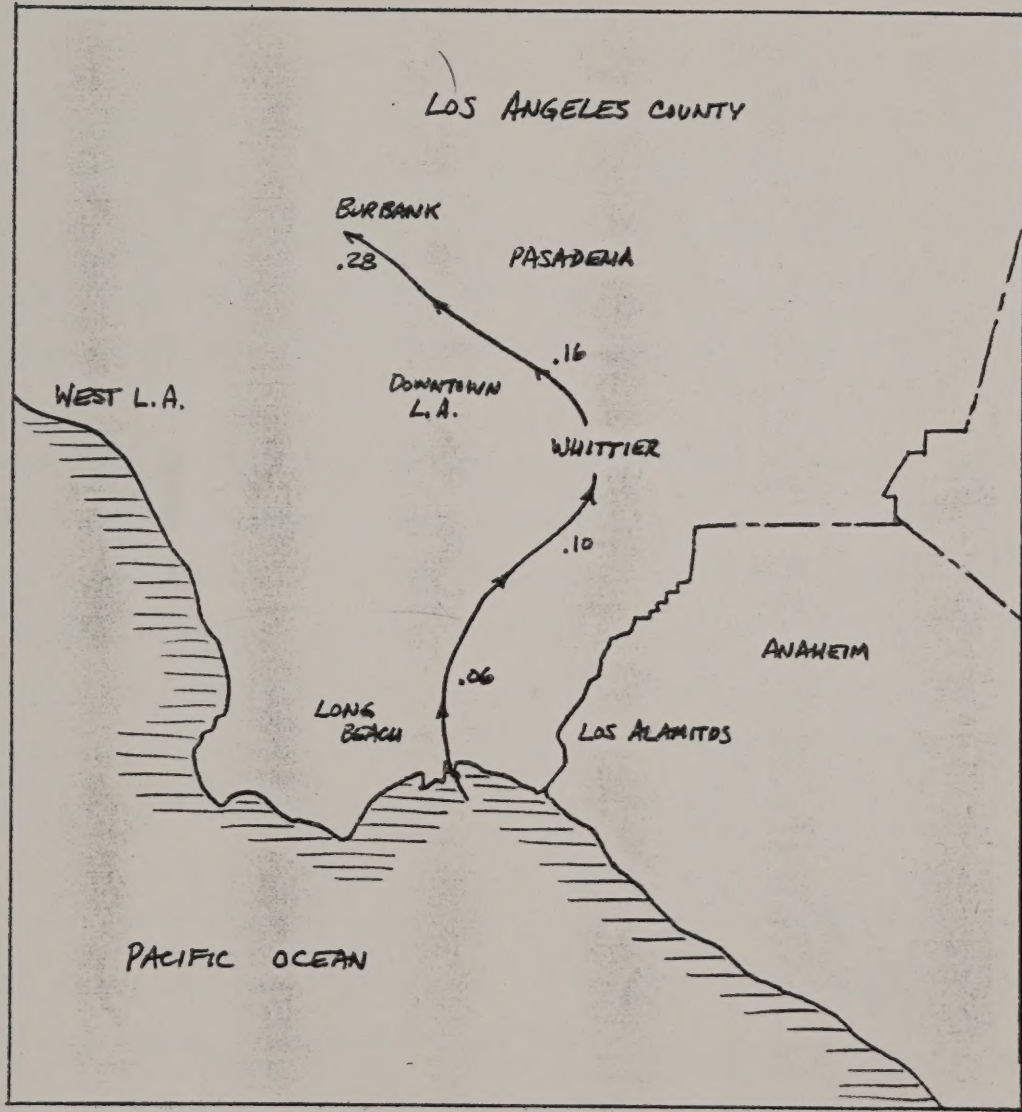


FIGURE 3 SCHEMATIC OF AIR PARCEL TRAJECTORY

PREPARATION PLAN FOR WATER QUALITY WORK COMPONENT

INTRODUCTION

This work plan has been prepared in accordance with the contract specifications with consideration given to the verbal discussions held with the BLM staff prior to and after the award of the contract to ERT. The scope of the work planned is fully in accordance with the work statement in the RFP, the proposal, and the written responses to the various questions posed.

In our review of the Environmental Impact Assessment prepared by William Bros. and submitted by the Sohio Transportation Company we have found that the description of the existing environment appears to be adequate and therefore the effort required on our part will not be demanding. On the other hand, the evaluation of the potential impact of the project on the water resources of the drainage basins through which the proposed pipeline passes requires considerable restructuring and analysis.

Two documents which are required for a realistic evaluation of the impacts of construction and operation were not available during the preparation of the work plan. These documents are:

- Hydrostatic test plan for the pipeline
- Operation Oil Spill contingency plan

The absence of these documents seriously impaired our ability to determine the complete nature of the tasks required to complete our assessment. It is assumed, in our estimate of resources required, that these documents will be available no later than 2 July 1976.

2.1 Existing Environment

2.1.5 Water resources and quality

The objective of this task is to describe the present fresh water resources and water quality along the pipeline route and at the inland terminals. Water quality and use will be described following the structure used by the applicant in the submission (the EIA), for the major drainage basins and sub-basins.

2.1.5.2 Pipeline route

The quality and quantity of surface waters along the pipeline route will be described. It is anticipated that the task will consist mainly of verification and documentation of the applicants submission, Section 2A.5.

The nature and capacities of ground water supplies will be described with special attention to the groundwater proximity to the pipeline in terms of groundwater depth and intervening materials. Major consolidated aquifers will be identified. The material in the applicants submission will be reviewed for completeness and to insure that latest available data has been included. Water usage in the various sensitive water areas will

will be described in terms of consumptive and recreational use.

2.1.5.3 Terminal Areas

The description will follow the same lines as discussed in 2.1.5.2 above.

2.1.5.4 Water Quality Standards

Applicable water quality standards will be identified and documented. These standards will be obtained from state and federal agencies having jurisdiction along the route.

Completion Schedule:

A preliminary draft report will be submitted on 6 July 1976.

Resources required: 90 hours

Relevant Available Data Sources:

U.S. Geological Survey

U.S. Army Corps of Engineers

Bureau of Reclamation

Texas Agencies

Bureau of Economic Geology

(Maintains an extensive environmental mapping program)

Department of Agriculture

State Department of Health

State Soil and Water Conservation Board

Water Quality Board

Texas Water Rights Commission

Association of Texas Soil and Water Conservation Districts

New Mexico Agencies

Department of Agriculture

Department of Game and Fish

Environmental Improvement Agency

State Bureau of Mines and Mineral Resources

State Engineer Office - Interstate Stream Commission

State Park and Recreation Commission

State Natural Resources Conservation Commission

Four Corners Regional Commission

Arizona Agencies

Department of Health Services - Water Quality Bureau

Arizona Water Commission

Game and Fish Department

California Agencies

Water Resources Department

Water Resources Control Board

Food and Agriculture Department

Parks and Recreation Department

California Coastal Zone Conservation Commission

Fish and Game Department

Methods and Procedures

The description of the present water resources will be accomplished by narrative utilizing standard maps showing regions of specific interest. It is anticipated that maps from the USGS and from the applicant will be utilized.

2.2 Future Environment Without the Project

2.2.5 Project water resources, quality and use.

The water quality of the basins within which the project falls will be projected to the year 2000.

2.2.5.2 Pipeline route

The agencies specified in the relevant data sources section given in Task 2.1.5 will be contacted to obtain all available relevant data concerning the planned utilization of available water resources in the various basins. These data will be reconciled with the data provided in the Westwide Study Report on Critical Water Problems facing the Eleven Western States issued by the U.S. Department of the Interior in April 1975. Specific emphasis will be placed on major planned projects such as the Central Arizona Project through which the proposed pipeline will cross.

In addition, the studies of the National Commission on Water Quality will be used where applicable. Although the Commission has been disbanded their work on the Upper Rio Grande and Colorado River basin will be of significant value.

Completion Schedule:

A preliminary draft will be submitted on 6 July 1976.

Resources Required: 30 hours

Methods and Procedures:

Same as in Task 2.1.5.

CHAPTER 3

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1 Existing Environment

3.1.4 Water resources and quality

The objective of this task is to describe the impact(s) of project in terms of potential degradation of fresh water resources in the drainage basins through which the pipeline route passes. This task will consider impacts of construction as well as impacts of initial operation of the proposed facility.

3.1.5.2 Pipeline Route

The potential impact of construction activities will be evaluated. The parameters which will be considered include:

- Area of exposed soil
- Amount of excavation and/or fill
- Potential amount of soil erosion and sediment transports.
- Potential generation of pollutants resulting from the construction activities
- Engineering of river stream and wash crossings
- Diversion of small streams
- Consumptive use of water during construction activities

The potential impact of hydrostatic testing will be evaluated. It should be noted that the applicant's submission considers only the case of transport of test water from Los Angeles to Midland. Discussions with BLM and William Bros. personnel have indicated that this is not a realistic plan and that intentional discharge of hydrostatic test water must be considered. Scenarios will be developed which will consider intentional discharge at up to five points along the route. In addition, the impact on local supplies of obtaining this test water will be evaluated, including the specific parameters:

- Potential flooding of small streams and washes
- Infiltration of waste water into groundwater
- General physical damage to stream beds and banks
- Degradation of local water quality

A realistic assessment of the potential impact of the operation of the pipeline on the water quality will be difficult, if not impossible, without the availability of the applicant's Oil Spill Contingency Plan. It is assumed that the plan will contain the information necessary to evaluate the maximum spill quantity, the maximum amount of time required to respond to a spill, and the measures which will be taken in each geographical area. This work plan has been prepared on the assumption that the contingency plan will be available by 6 July 1976.

The potential impact of spills will be evaluated by drainage basin with special attention devoted to sensitive water areas. Such sensitive areas will include the Colorado River crossing, the Gila River crossing, the

aquifer between Tucson and Phoenix, the Rio Grande crossing and the Pecos River crossing.

The evaluation will include:

- Estimation of the rate of transport of petroleum spills to groundwater storage by basin
- Evaluation of potential impact of undetectable leaks on groundwater
- Impact of spills on local consumptive and recreational water uses

The material from the engineering evaluation of RBA will be utilized to estimate the impact of leakage and chronic spills from pumping stations and their associated surge tanks. The impact on water quality due to catastrophic events such as seismic activity will also be assessed with reference to the geological evaluation. The impact of the terminal facilities will be evaluated with respect to both construction and operation. The extent of clearing required for the storage tanks as well as their proximity to groundwater will be investigated. The impact of the utilization and disposal of water required for proof testing of the storage tanks at the terminal facilities will be reviewed.

Evaluation of the impact of operation of the terminals will include the impact of:

- Consumptive use of water
- Storm runoff in the tank areas
- Infiltration of oil into local ground water
- Disposal of storage tank drawdown water

3.2 Cumulative impacts

3.2.4 Water resources and quality

It is anticipated that the projected (2000) water quality impact will not differ significantly from the immediate (1980) impact except for the impact of the proposed project on other projects to be constructed during the twenty years.

All major regional projects, such as the Central Arizona Project will be reviewed to determine the impact, if any, of the proposed pipeline project. In addition the long term cumulative effects of chronic leaks and minor spills will be evaluated for surface and groundwaters.

The impact of other projects on this project will be considered. For example, significant overdraft of groundwater may cause subsidence which in turn can cause severe stress on the pipeline structure. Input for this type of consideration will be obtained from the geotechnic portion of the evaluation.

Relevant Data Sources:

See Section 2.1.5

Sohio Transportation Company Oil Spill Contingency Plan

CHAPTER 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

The objective of this task is to compile and evaluate possible mitigating measures. A list of mitigating measures required by Federal and State Agencies will be developed and the applicants proposed mitigating measures will be reviewed for completeness.

Methods and Procedures to be Utilized:

Mitgating measures to be evaluated include:

- Leak detection system to be employed
- Emergency controls to be utilized in sensitive areas
- Sizing of dikes, tank liners, and retaining walls
- Bank erosion control techniques
- Small stream and wash crossing techniques including restoration of natural sites
- Reinforcement and pipeline linings in sensitive areas and in unstable soil structure areas
- Spill emergency procedures

The evaluation will include calculation of the amount of oil which can be retained per unit volume for the representative soils in the various areas using standard equations.

The cause effect impact on the water quality will be considered for each of the basins under the assumptions of:

- 1) No mitigating measures
- 2) The applicants proposed mitigating measures
- 3) Complete implementation of all mitigating measures

CHAPTER 5

ADVERSE IMPACTS THAT CANNOT BE AVOIDED

5.1 Natural Environment

5.1.4 Water resources and quality

The objective of this task is to evaluate those impacts on the quality (and quantity) of the water and resources which cannot be avoided should the proposed project be implemented.

Methodology:

The results of the impact evaluation conducted in Task 3.1.4 and 3.2.4 will be discussed in terms of definition of "adverse" and "unavoidable". It is anticipated that these will be limited to impacts due to temporary siltation and erosion during construction, impacts associated with the hydrostatic testing plan and the consequences of oil spills.

Completion Schedule:

List of causes to be submitted by 12 July 1976. Preliminary draft of impact evaluation to be submitted by 23 August 1976.

Resources Required:

240 hours

FINAL REPORT

A final report will be delivered on 16 September 1976. It will be a consolidation of all the preliminary draft reports.

Resources Required:

100 hours

WORK PREPARATION PLAN

NOISE

In accordance with the contract this Preparation Plan for the Noise work component has been prepared by ERT. The plan covers the pipeline system from the border of the Long Beach Port to the Midland Terminal, not including the terminal facilities within the port. The plan follows the outline provided by the BLM for the EIS the BLM is preparing, and delineates the tasks, completion schedules, resources required, data sources and methodologies to be used to write the preliminary draft and final reports.

This Preparation Plan is predicated on the availability of a detailed Proposed Action description by the applicant. That is, more information on the planned construction and operation of the pipeline system is necessary than is currently available in the Williams Brothers Engineering Company (WBEC) EIA. For example, pipeline construction schedules and pump locations must be explicitly described in order to allow the assessment of noise related impacts. In the absence of such specificity, a general characterization of impact will be presented as developed from an assumed route, based on all available data. The actual choice of approach will be made as late as possible in the project in order to utilize more accurate location data.

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

2.1 EXISTING ENVIRONMENT

2.1.11 Noise

The WBEC EIA approach of defining existing ambient noise levels by land use will be expanded upon and quantified. The accuracy of the determinations and the corresponding uncertainties due to variations in pipeline route limits of knowledge of land usages, the general nature of characterization of noise levels by use categories and variations because of seasonal and daily patterns of lifestyle and climatic conditions will be specified.

Measurement reports of existing ambient noise will be gathered and used to calibrate and verify the land use representations of noise levels. Specific existing, individually significant noise sources that will interact with the proposed project noise emissions and concurrently contribute to ambient noise levels will be identified. This will be done using the WBEC aerial photos, input from the fly over, and physical inspections within the budget limits.

In order to delineate the areas where more than land use projections of ambient noise levels are necessary, potential receptors will be reviewed along the entire pipeline route. The list of sensitive receptors described in the WBEC EIA will be checked and corrected as necessary.

The Midland, Texas Terminal area will be specifically reviewed in terms of existing significant noise sources and ambient noise levels, in a manner similar to that for the pipeline.

The list of federal, state and local noise regulations in the WBEC EIA will be reviewed for accuracy and inclusiveness and expanded to indicate the nature and specifics of the source limitations and allowable ambient levels.

2.2 FUTURE ENVIRONMENT WITHOUT THE PROJECT

2.2.11 Noise

The ambient noise levels for the year 2000 will be projected based on the effects of legislation of motor vehicle noise emissions and control of major sources, balanced by the growths of sources due to population increases along the pipeline route.

The Midland area will be reviewed in terms of future noise sources and controls, as for the pipeline route.

Future (2000) federal and local regulations for the control of noise will be briefly discussed.

Completion Schedule

A preliminary draft report on the existing environment noise component will be delivered on July 6, 1976.

Resources Required

80 hours labor

80 hours labor

Relevant Available Data Sources

1. ERT reports and studies.
2. U.S. EPA Report NTID 300.3 Community Noise, December 31, 1971.
3. Chapter 18 criteria for Noise and Vibration in Communities, Buildings and Vehicles Noise and Vibration Control, 1971.
4. "City Noise - Los Angeles", July, 1975 Noise Control.
5. Growth plans and land use projections from other ERT sections.

CHAPTER 3

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1 EXISTING ENVIRONMENT

3.1.10 Noise

Task Description and Methodology

The proposed action will result in both short duration (construction and inspection/maintenance operations) and long term (pumping station 24-hour operation) noise emissions. The extent of the environmental impacts resulting from such noise emissions is a function of intensity of the noise levels relative to existing ambient noise. It is also dependent upon the number and type of noise sensitive receptors exposed to the project related noise emissions. Since the only information that exists now is a description of the general character of pipeline construction operations and pumping system component requirements, a generalized, non-site specific set of guidelines for the minimization of noise impact will be developed within this task framework.

Scenarios of source emissions for construction, maintenance and operation of the pipeline will be developed to represent the maximum realistic noise emissions situation in each case.

The sensitive receptors, noise emission scenarios and baseline noise levels will be utilized as input to the ERT sound level propagation model ERTNOI (described in the proposal and technical questions) to predict relative impacts.

3.2 CUMULATIVE IMPACTS

3.2.10 Noise

Cumulative impacts will be treated as the interaction of the projected environment in the year 2000 without the project and the noise sources identified and evaluated in the existing environmental impact case. The only known significant noise emissions from operations will be from the pumping stations along the route. This will be verified.

3.2.10.1 Midland Terminal Area

The pumps at the Midland Terminal will also be discussed in terms of noise emissions added to the predicted ambient conditions in the year 2000.

Completion Schedule

A preliminary draft report of the Impact Causes will be submitted on July 12, 1976. It will consist of a brief review and list of the significant sources of noise in the project and why they will cause impacts.

A preliminary draft report of the Impact Evaluation will be submitted on August 23, 1976.

Resources Required

120 hours

Relevant Available Data Sources

1. W.B. Lang, "Status of Noise Control Regulations in USA" Internoise '75 Conference, Japan.
2. "Theory of Steady State Urban Noise for Ideal Homogeneous City", JASA, 51, 1972.
3. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliance, NTID 300.1 USEPA, Dec. 31, 1971.
4. "Noise-Control Data Sheets", Noise Control Manual, Board of Engineers, SOCAL, 1972.
5. Public Agencies, state, county, local.
6. "Information on Levels of Env. Noise Requirements to Protect Public Health and Welfare with an Adequate Margin of Safety", U.S. EPA, March, 1974, 550-9-74-004.

CHAPTER 4

MITIGATING MEASURES NOT INCLUDED IN THE PROPOSED ACTION

4.0.1 Methodology for Determining Mitigation Measures

An evaluation will be made of the possible Proposed Action mitigating measures and definitions will be prepared of "mitigating" in terms of engineering feasibility, practicality and economics.

4.0.2 Summary of Mitigating Measures

An annotated list of measures will be prepared.

4.1 MEASURES REQUIRED BY FEDERAL AGENCIES

4.2 MEASURES REQUIRED BY STATES AND OTHER ENTITIES

In each of these sections, excluding the port portions, noise control and mitigation requirements will be reviewed. A list will be prepared in chart form of all requirements. The primary source of data will be the applicant permit list, if it is available from WBEC.

Completion Schedule

This chapter will be included in the draft report on Impact Evaluation, due August 23, 1976.

Resources Required

24 hours.

Relevant Available Data Sources

1. W.B. Lang, "Status of Noise Control Regulations in USA" Internoise '75 Conference, Japan.
2. "Theory of Steady State Urban Noise for Ideal Homogeneous City", JASA, 51, 1972.
3. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliance, NTID 300.1 USEPA, Dec. 31, 1971.
4. "Noise-Control Data Sheets", Noise Control Manual, Board of Engineers, SOCAL, 1972.
5. Public Agencies, state, county, local.
6. "Information on leads of Env. Noise Requirements to Protect Public Health and Welfare with an Adequate Margin of Safety", U.S. EPA, March, 1974, 550-9-74-004.

CHAPTER 5

ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

Unavoidable adverse impacts will be evaluated in terms of definition and summary. A comparison will be made to the mitigation feasibilities determined in earlier discussions.

5.2 HUMAN ENVIRONMENT

5.2.3 Noise

The adverse impacts associated with construction and operation of the pipeline and the Midland Terminal will be described.

Resources Required

56 hours.

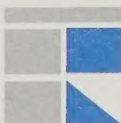
Completion Schedule

This section will be part of the preliminary draft report of Impact Evaluation, due August 23, 1976.

FINAL REPORT

A final report will be delivered on September 16, 1976. It will be a consolidation of all the preliminary draft reports. 80 hours are allocated to it.

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